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William F. Happich

Scales and Chord Studies

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INCLUDING:

A FEW SCALES AND CHORDS EMPLOYED
IN MODERN COMPOSITION AND
AN OUTLINE OF THE SCALES
OF OTHER PERIODS.

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Scales and Chord Studies for Violin

By William F. Happich

(Camden, N. J.: Friant Music Co.)

The average book of scales and scale studies for the violin or any other civilized instrument is a pretty dull affair. This one by Mr. Happich is not "average"; it is one of the exceptions and is an illuminating work in many ways.

To begin with, this fine Philadelphia musician has written an introduction which in itself would distinguish it from other scale-books. Mr. Happich here discusses the subject of scales, what they are, and then gives the nine scales, which as he says "are to be considered of interest to us, either historically or because we find them in use to-day." Part I follows, devoted to the diatonic scales, chord-studies and chromatic scales in two octaves. The same material is treated in three octaves in Part II. And here let us say that the manner in which the scales are written out, not indicated, as in so many scale-books, is worthy of note and should be valued by teachers, many of whose pupils are not intelligent enough to know how to practise a scale unless it is written out. All the major and minor scales are treated in double-stops in Part III and again we note that they have been written out for completeness.

Part IV is entitled "The Scales and Chord-Structures Employed in Modern Composition." Here Mr. Happich has prepared for the violin student the whole-tone scale, writing it out in its several enharmonic manifestations as regards notation. The fingering given is excellent and the text matter explaining the chord-structures proves that Mr. Happich knows his music of to-day as well as his music of yesterday. The whole-tone scale in sixths and thirds is splendidly handled also. In a letter about this part of the work to a friend Mr. Happich recently wrote: "It was inspired by my love for the modern and by my desire to give my pupils and brother-violinists insight from a violinistic viewpoint and an opportunity to acquire the necessary technique to play modern music through systematic studies, based on a thorough understanding of the material used. I would like to feel that my efforts will create better understanding and more interest and love for the music of to-day and the future among students and professional violinists." In similar manner to the whole-tone scale Mr. Happich deals with the "half-tone" scale, and the chord-structures following. There are also splendid studies on the various species of chords constructed of the interval of the fourth, and some material about "alterations of the seven-tone system" and the pentatonic scale.

Mr. Happich is, to be sure, not the first one to take up this phase of modern scales, or rather scales employed in modern music. Franz C. Bornschein, the Baltimore composer and violinist, in making a revised edition of Schradieck's "Scale Studies" a few years ago, added a supplement dealing with this subject and handled it in his usual exemplary manner. Mr. Happich's treatment of the subject is, however, admirable and will come to the attention of many more violinists, we believe, as one does not look in an old standard book like Schradieck for whole-tone scales. We would express our warm approval of Mr. Happich's work, which is that of a musician who not only understands the violin completely, but also reveals a deep and searching pedagogic sense. We are in need of just such study works for the violin. Perhaps Mr. Happich will give us some more.

A. W. K.

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PREFACE

The purpose of presenting this work to the instructor and student, is to give access to a set of scales which is complete, all thirty diatonic keys being represented instead of the usual twenty-four or twenty-six. It is also offered as a work which contains information and practical illustrations of some of the scales and chords employed in modern composition. The brief outline of the construction of scales of various periods should prove of interest to the student, and will show the development of our present systems.

Of the diatonic scales, the three-octave scales are of course the most important to the violinist. In the fingering here applied full consideration has been given the structure of the scale and its character, applied to the instrument, and the habits formed by scale-playing which should be practical, useful and adaptable to all circumstances.

It will be found that in all scales, with the exception of those on G, G sharp, A flat, A and A sharp, the first finger is placed on the root beginning the second octave of the scale, and on the root, third and fifth in the third octave ascending, thus creating a fingering which is natural and which is more uniform than in some systems heretofore used as applied to the scales generally. This system does away with the impractical custom of using the fourth finger three times in succession in the highest octave (seventh, root, seventh), as well as the custom of using the first finger on the seventh for change of position in the second octave. Descending, one change of position in the highest octave will be found, fourth finger over the first finger, where formerly two changes were employed. All scales begin in as low a position as is practical, it having been found more practical in actual use to begin from a low position and to return to it, rather than a higher one. The two-octave scales are fingered on the same basis, as a preparation for the three-octave scales. The chord-studies consist of chords and inversions of chords most frequently used, constructed on the tonic, rather than chords strictly within the key.

Regarding the scales and chords employed in modern composition, whatever prejudice may exist should be speedily cast aside and the fact recognized that modern music has come to stay, that it is really a legitimate development of the art technic of the great masters, and that its many licenses and newly adopted customs are founded on well-established scientific facts. It is the open door to a future in music at least equally as glorious as that of the great classic period, if not more so. Every violinist should become as thoroughly intimate with these scales and chords, as with those of the diatonic system, as it is to be hoped that every serious student will devote himself to a thorough study of the theory of music, which is an absolute necessity to the musician of the present period. Thanks is hereby given to the Boston Music Co. for the courtesy extended in granting permission to quote extracts from A. Eaglefield Hull's "Modern Harmony," the greatest book of the day upon the subject.

WILLIAM F. HAPPICH.

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To
MR. EDWIN A. FLEISHER
as a token of friendship and regard.

INTRODUCTION.

To the questions, "What is a scale?" "What is meant by modes, tonality, and key?" the following definitions will serve best as answers:—

1. A scale is a series of tones which succeed each other by single steps. It is diatonic, if these steps are whole-tone and half-tone successions; chromatic if these steps are all half-tone successions.

2. Mode or tonality is the relation which a series of tones of a definite diatonic arrangement assume towards a chosen principal tone, which we now call the "tonic." In the Greek system of scales, as well as during the early and middle period of the old Church modes, this relation was of a purely melodic character, being based on the different melodic forms assumed by using the different degrees of a fixed scale as a point of departure and terminating an octave higher, (an octave lower in the Greek system) the initial and final tone being considered as the principal tone of each such formed mode. These modes or tonalities could be subjected to transposition without influencing their form or character.

3. Tonality, and all that it implies in the sense of present day usage, also means key, or the unity in key relationship of a phrase, or a composition, or a group of compositions which are united into one larger form as is the sonata, the symphony, etc.

4. Key as understood today is the relation which a series of tones of a definite diatonic arrangement and their resulting chord-structures assume toward a fixed tonic of approximately definite pitch. The present system consists of two keys, major and minor; the major key having one scale, the minor key admitting of two forms, melodic and harmonic. While this system is not considered to be subject to transposition, it consists actually of but physical duplications of both keys on tones of different degrees of pitch, each one assuming the name of the tone which forms the tonic.

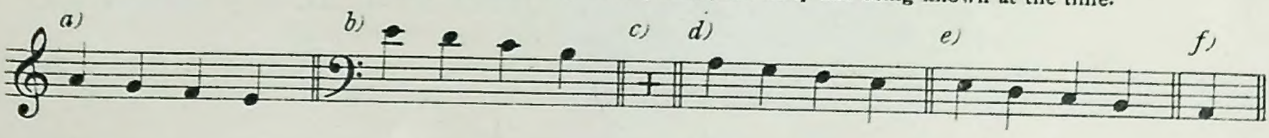
All scales, modes, tonalities and keys are in part the creation of the genius of man. The scales particularly, must be viewed as a matter of convention, subject to changes.

H. v. Helmholtz, in "The Sensation of Tone," Part III, chap. XIII, states: "The system of scales, keys and their harmonic structures do not depend alone upon unalterable natural laws, but they are also partly the consequence of aesthetic principles which have been subject to changes with the progress of mankind, and which are subject to still further changes in the future." This quotation explains the existence of so great a variety of scales, and it is deemed advisable to separate them into groups and become acquainted with their nature and construction. Of the scales to be considered of interest to us, either historically or because we find them in use today, the list comprises the following:—

1. The Greek Scale System,
2. The Church Modes,
3. The Present day Diatonic System,
4. The Chromatic Scale,
5. The Six-tone Scale,
6. The Twelve-tone Scale,
7. The Natural Harmonic Series,
8. The Modified Forms of Seven-tone Scales,
9. The Pentatonic Scale.

THE GREEK SCALE SYSTEM.

The earliest Greek scale consisted of but four tones, the "tetrachord," which they imagined downward, and which consisted of two whole-tone steps and a half-tone step. At a later period, a number of such tetrachords were arranged in succession and a lowest tone added to form one continuous scale through two octaves, which formed the basis for their whole system of modes. These modes were absolutely homophonic, harmony not being known at the time.



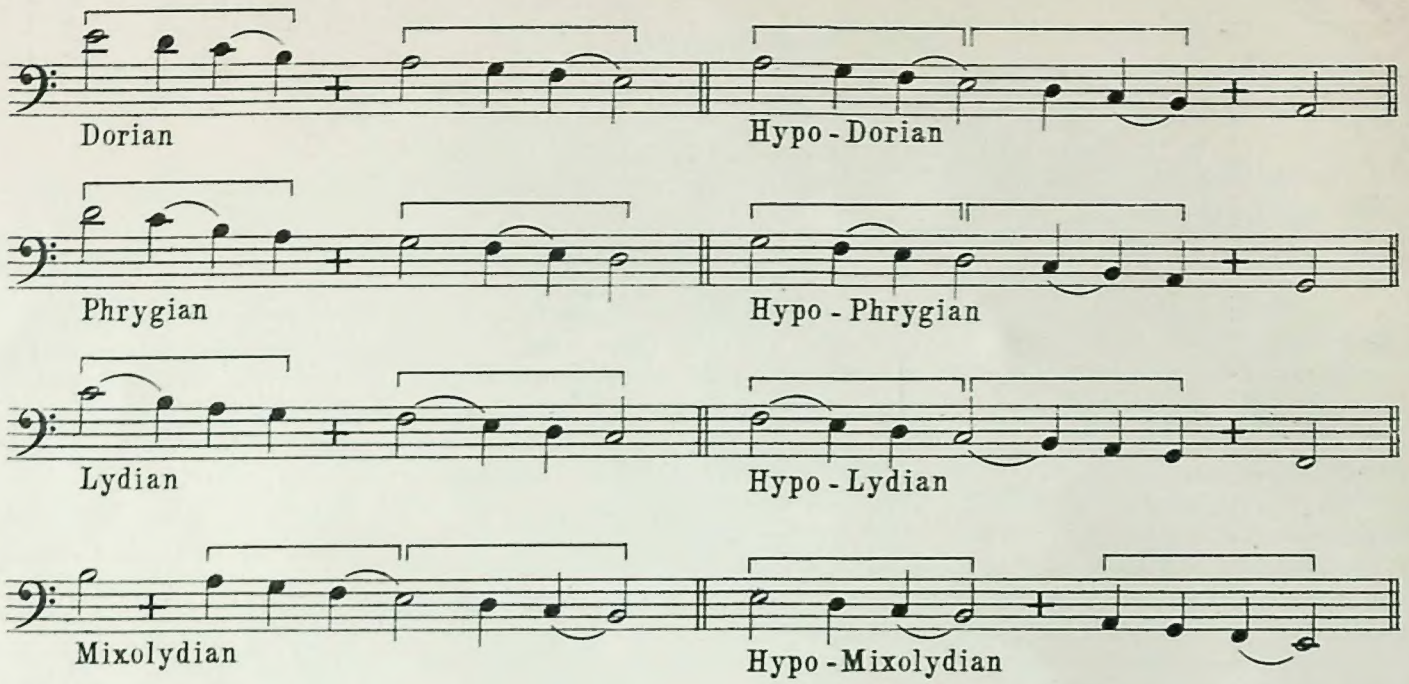
Tetrachords a and b, d and e were considered conjoined tetrachords, the final tone of the one being at the same time the initial tone of the next one. Tetrachords b and d were considered disjoined tetrachords, having a whole-tone separation (at c) between them, which was called "diazeuxis." At f we have the added lowest tone called "proslambanomenos," to complete the octave, the feeling for which the Greeks seemed to have acquired through contact with the Egyptians.

In the system of tonalities or modes which they evolved, each mode had the tonal range of an octave and consisted of a combination of two tetrachords, conjoined or disjoined, with the diazeuxis or whole-tone separation between the two tetrachords, before the first tetrachord, or after the last one.

Each mode had a different initial and final tone with resulting varying positions of the half-tone steps of the tetrachords A mode in which its initial tone and that of its second tetrachord formed a perfect fifth, was considered a principal mode; a mode in which this relation was reversed to form a perfect fourth, was considered a secondary mode and always had the syllables "Hypo" (i. e. "under") prefixed to the name it bore.

Of the ten modes recognized in Greek theory, the last two, the Locrian and the Ionian, seem to have been discarded by them after the earlier period of their musical development.

THE GREEK MODES



The half-notes denote the relation, initial tone and fifth, and its inverted order as with the secondary modes; the slurs indicate the half-tone steps; the crosses the diazeuxis or whole-note separation; and the brackets the tetrachords forming the mode.

Historians and theorists differ as to the exact division into tetrachords of some of the modes, in the designation of some of them and as to their exact number, some admitting of only nine.

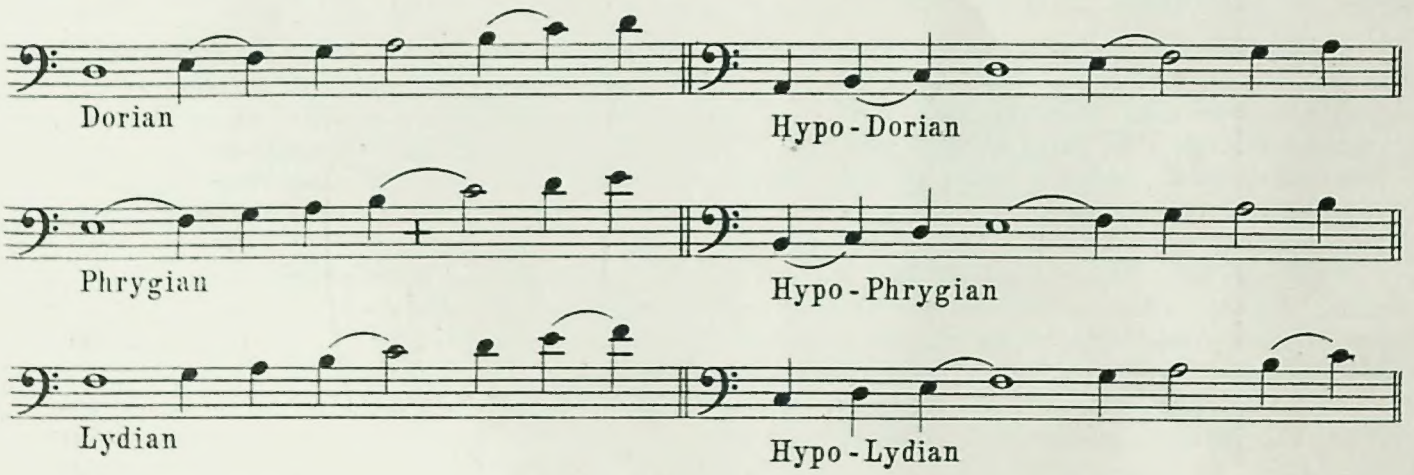
The Dorian mode was the standard or normal mode; Dorian, Phrygian and Lydian were the first or primitive modes, the others were added later. At a still later period of their development the Greeks also made chromatic additions and alterations to their system, which made it more complex, but did not alter it fundamentally.

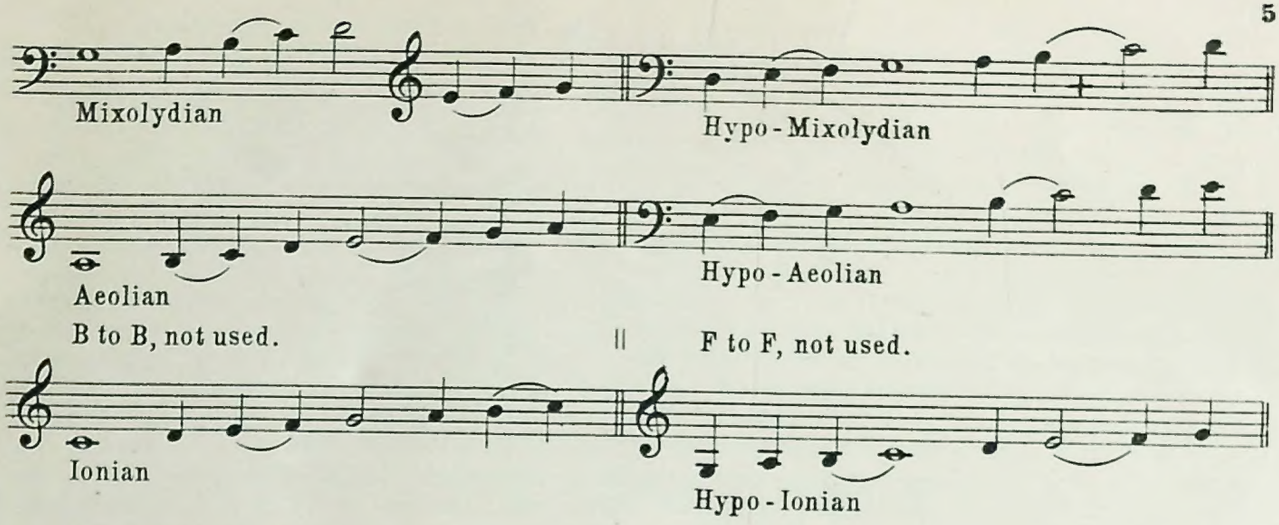
THE CHURCH MODES

The Ecclesiastical Tonalities of the Middle Ages consisted as did the Greek system, of a series of modes based on a fixed diatonic scale. Their use was purely melodic at first and their character absolutely so, yet they admitted of extensive polyphonic usage and served as a basis for the greater period of development of the contrapuntal era. The gradual recognition of the natural relation of thirds, chords constructed of such, and especially the importance of consonant chords and their position and relation within the tonality, and the further development of harmony, eventually led to the establishment of but two definite modes, our major and minor, to the exclusion of all others.

There were fourteen of these modes in all, seven authentic and seven plagal, of which each one bore a Greek name. An authentic mode began upon any one of the seven tones of the basic scale, which tone was always the "final" of that mode, and progressed to its octave above; a plagal mode consisted of the same series of tones as the authentic mode with which it was paired, but began on the fourth below the final tone and extended to the fifth above, and had, as in the Greek system, the syllables "Hypo" prefixed to the name it bore; thus, a chant or melody in an authentic mode would always be within the range of the final tone and its octave above; one in a plagal mode within the range of the fourth below and the fifth above the final tone. The tones which assumed the most importance in these modes were the final tone, which was nearly equivalent to our tonic and upon which every mode ended; the dominant or principal reciting tone; the mediant and parcipitant, upon which phrases other than the first and last might begin or end.

In the authentic modes, the fifth, with one exception was always the dominant; in the plagal modes the dominant was a third below that of the authentic mode with which it was paired, one mode excepted.





The whole-notes indicate the final tone of each mode; the half-notes the dominant; the slurs the half-tone steps; and the crosses the substitution of the next higher tone for the dominant. The tone B (or the equivalent) was never used as a final tone or as a dominant, the next higher tone being substituted; the two modes based on B were therefore discarded.

Composers of various periods have sought to revive these modes in part, and we find them in use occasionally, at present. "There are three ways in which modal influence comes into modern music:—

a. The pure and exclusive use of the notes of the mode,
b. Purely modal melody, with modern harmonic texture,
c. The conveyance of a remote modal feeling in any way whatsoever.

Few composers, however, use them entirely in the pure manner by drawing their harmonies exclusively from the notes of the scale. Beethoven employs the Lydian thus in the slow movement of the String Quartet in A minor (Op. 132) whilst amongst modern composers who have achieved this successfully may be mentioned Count Alexis Rebikoff, Joseph Bonnet, Maurice Ravel, and Otto Olsen. The latter has written an important set of nineteen variations on the Dorian plain-song "Ave Stella Maris," which is played entirely on the white keys throughout. A. Eaglefield Hull, "Modern Harmony," (by courtesy of The Boston Music Co, Publishers).

THE DIATONIC SCALE SYSTEM

The diatonic, our present system, consists of two modes or keys, major and minor. The major key possesses one scale; the minor key two scales, the harmonic and melodic; each of these scales consists of seven progressions or steps to the octave, whole-tone and half-tone steps. Each tone of the scales is designated with a numeral according to its order of appearance and is called a "degree."

The major scale and the harmonic minor scale are alike in their progressions, both ascending and descending; the melodic minor scale varies slightly, having the sixth and seventh degrees raised one-half tone in ascending and lowered to their normal position in descending.

Taking the seven natural tones into consideration and such of their chromatic alterations which permit of the placing of simple signatures up to seven sharps and seven flats (the employment of double sharps or double flats for this purpose being precluded), and constructing a major and a minor key upon each one and giving it the name of the tone upon which so constructed, we find that the system comprises thirty keys, fifteen major and fifteen minor keys, each minor key permitting of the construction of the two forms of scales

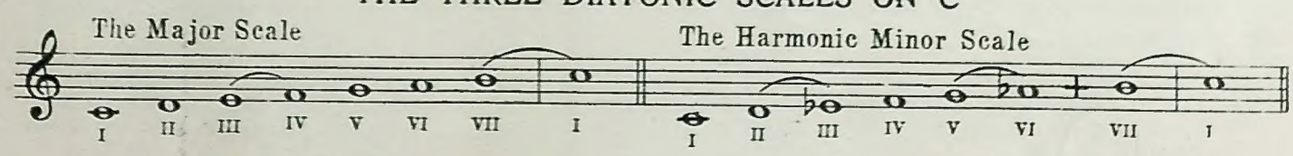
The major scale consists of five whole-tone steps and two half-tone steps, these half-tone steps being from the third to the fourth degree, and from the seventh to the first degree ascending; the same in reversed order descending.

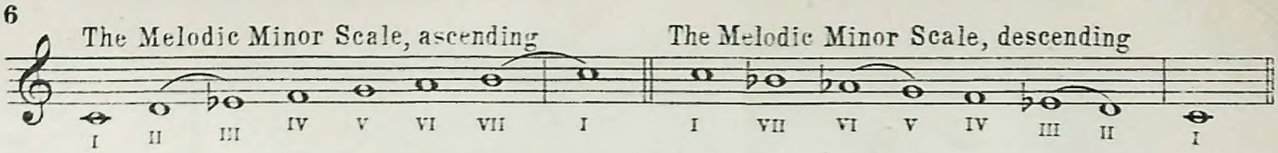
The harmonic minor scale consists of three whole-tone steps, three half-tone steps, and one step of one-and-a-half-tones. The half-tone steps are from the second to the third degree, fifth to the sixth degree, and seventh to the first degree; the one-and-a-half-tone step is from the sixth to the seventh degree, all ascending; they are the same in reversed order in descending. The seventh degree is raised one-half tone above its normal position in both directions, for harmonic reasons.

This scale, as its name implies, forms the basis for the chord structures in minor.

The melodic minor scale consists of five whole-tone steps and two half-tone steps, one half-tone step varying in position in ascending and descending. In ascending the half-tone steps are from the second to the third degree, and from the seventh to the first degree; in descending from the sixth to the fifth degree, and third to the second degree. The variance in position of the half-tone step is caused by the raising of the sixth and seventh degrees one-half tone above their normal position in ascending to further the upward melodic tendency of the scale; and by lowering them to their normal position in descending to further the downward tendency.

THE THREE DIATONIC SCALES ON C



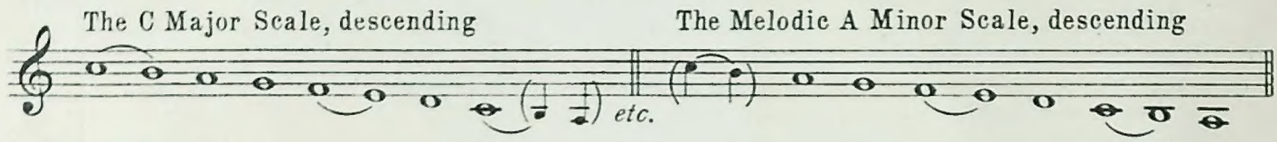


The Roman Numerals indicate the degrees, (*) the slurs the half-tone steps, and the cross the step of a tone-and-a-half. All the others are whole-tone steps.

The names of the seven degrees of both the major and the minor scales are:—

I, tonic; II, super-tonic; III, mediant; IV, sub-dominant; V, dominant; VI, sub-mediant, and VII leading tone.

The flats and sharps which are necessary (except those required for alteration of the seventh degree in the harmonic minor scale, and of the sixth and seventh degrees in the melodic minor scale) to formulate the scales and give them proper notation are placed at the beginning of the staff and form what is termed the "signature;" thus a scale requiring the use of three flats for its construction will have a signature of three flats, a scale requiring four flats a signature of four flats, etc. Each signature can represent two keys and their scales. For every scale in major, there will be found one in minor which consists of almost the same series of tones, and whose resulting signature will be the same; these two scales and their keys are termed "relative," they always stand a minor third apart, the relative minor key and scales having their tonic on the third half-tone below the tonic of the major key and scale to which related This close relation can easily be seen by comparing the descending melodic minor scale with its descending relative major scale.

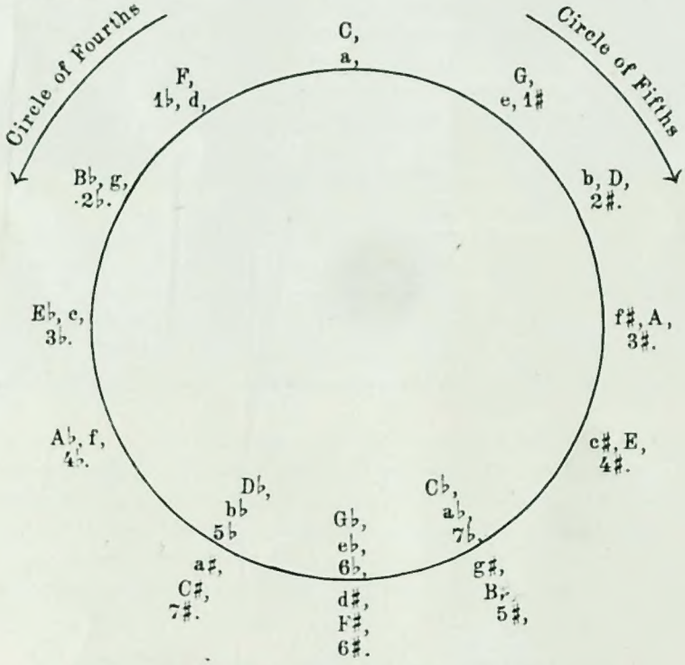


thus, C major and A minor are relatives, both do not have a signature; F major and D minor are relatives and both have the same signature of one flat; G major and E minor are relatives, etc.

Major and minor keys and scales having the same tonic are termed "parallel," thus C major an C minor are parallel; A major, and A minor parallel, etc.

The circle of fifths or fourths:—if we take C major and its relative, A minor, the two not possessing any signature, as a fixed point and progress from these upward by perfect fifths through various keys (taking into account the enharmonic or double use of B and C flat, F sharp and G flat, C sharp, and D flat, etc., as in the equal temperament in tuning), we return to our starting point at the twelfth step; this progression is called the circle of fifths; if we reverse direction and proceed downward by perfect fifths it is called the circle of fourths, the downward calculation being considered as of inverted order, a fifth below being and inverted fourth of above.

Progressions along the circle of fifths take us from C major and A minor through the keys possessing sharps, in their regular order of appearance:—G major and E minor, one sharp; D major and B minor, two sharps, etc., to seven sharps, the latter part of the circle is completed through keys possessing flats, in diminishing order. The process is reversed when progressing along the circle of fourths.

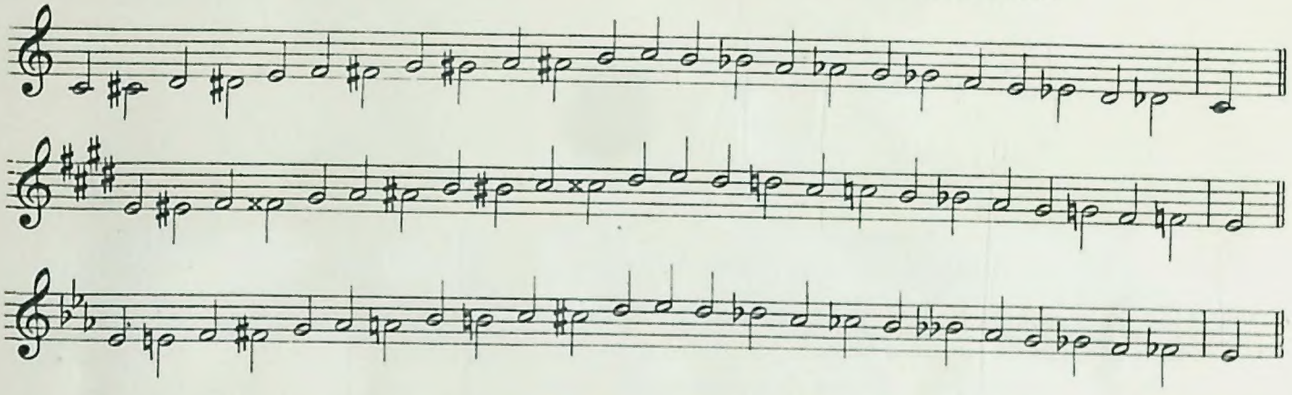


The capitals indicate the major keys, the small letters their relative minor keys, the numerals followed by a sharp or flat their signature.

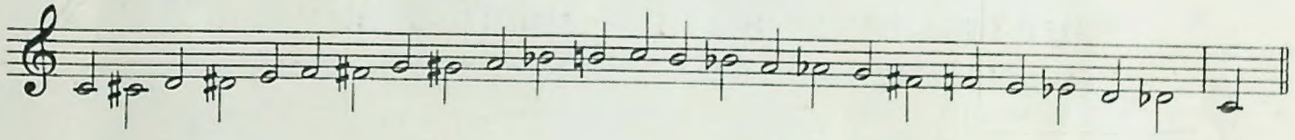
(*) Some theorists use the figure eight to represent the conclusion of a scale, which custom is misleading; the fact should always be borne in mind that the diatonic scales consist of seven degrees absolutely and that whatsoever follows after these is but repetition in a higher or lower octave, the first degree is always the first degree, though it might be the eighth, or fifteenth, or twenty-second, etc. tone in the order of succession of tones,

A chromatic scale is a succession of half-tone steps, twelve to the octave. Chromatic scales do not express key, therefore can never represent a key; they can appear within any key, but do not carry any signature of their own. All chromatic scales as such (not to be confused with the modern twelve-tone scale) are modifications of the diatonic scales, the five additional steps being derived through chromatic alterations of various degress of the diatonic scales. A chromatic scale can begin and end on any tone within any key, the effect will always be the same except the difference in pitch of one scale or another placed higher or lower. In notation, the correct method is to take advantage of the existing signature at the period of its use, and to raise the various tones of the key to fill in by half-tone steps the usual number of whole-tone steps ascending; the reverse in descending by lowering the various tones of the key to fill in the usual whole-tone steps, the tones of the key being at all times represented correctly. This method entails the use of the least number of accidentals, only five being used in either direction, and is the simplest, it is generally not adhered to, however, the custom of lowering and raising the seventh ascending and raising and lowering the fourth descending seems to be well established, as is the custom of adapting the notation to suit the technical requirements of various instruments.

A FEW CHROMATIC SCALES, CORRECT NOTATION



With notation showing lowered and raised seventh ascending, and raised and lowered fourth descending.



The stems in upward direction indicate the tones of the key, those in downward direction their chromatic alterations, which fill in the usual whole tone steps.

PART I

THE DIATONIC SCALES, CHORD STUDIES AND CHROMATIC SCALES IN TWO OCTAVES

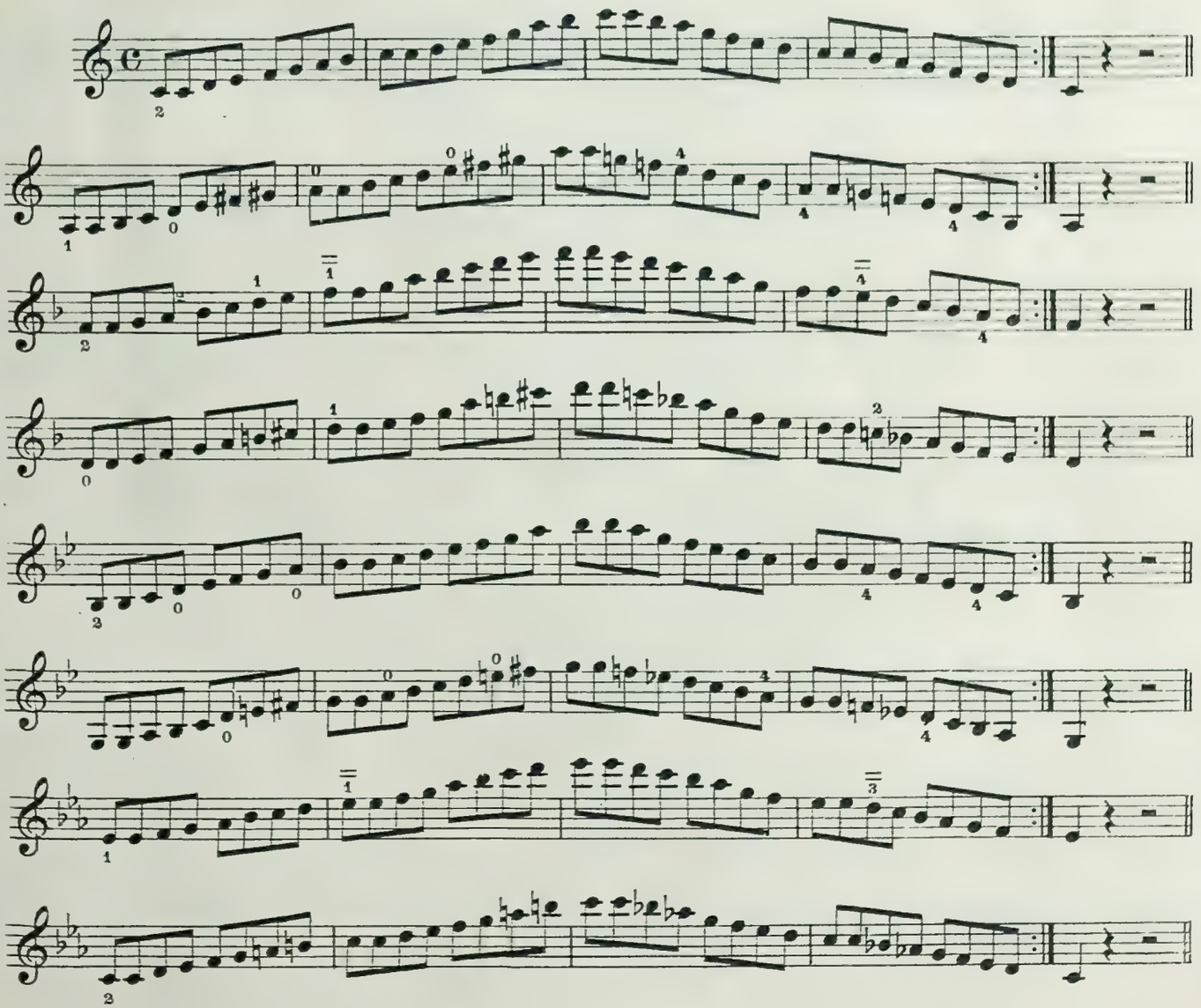
PART I

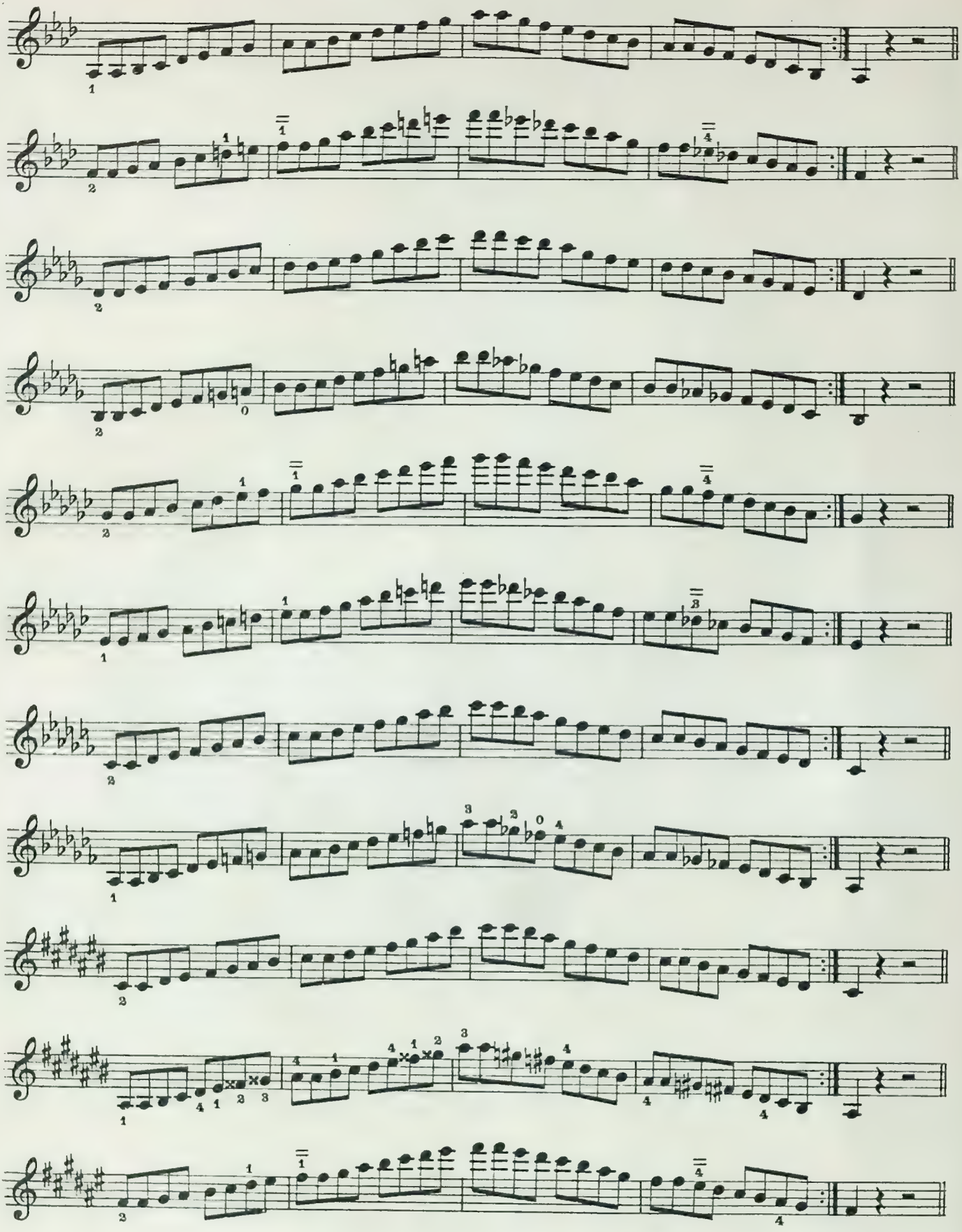
THE DIATONIC SCALES, CHORD STUDIES AND CHROMATIC SCALES IN TWO OCTAVES

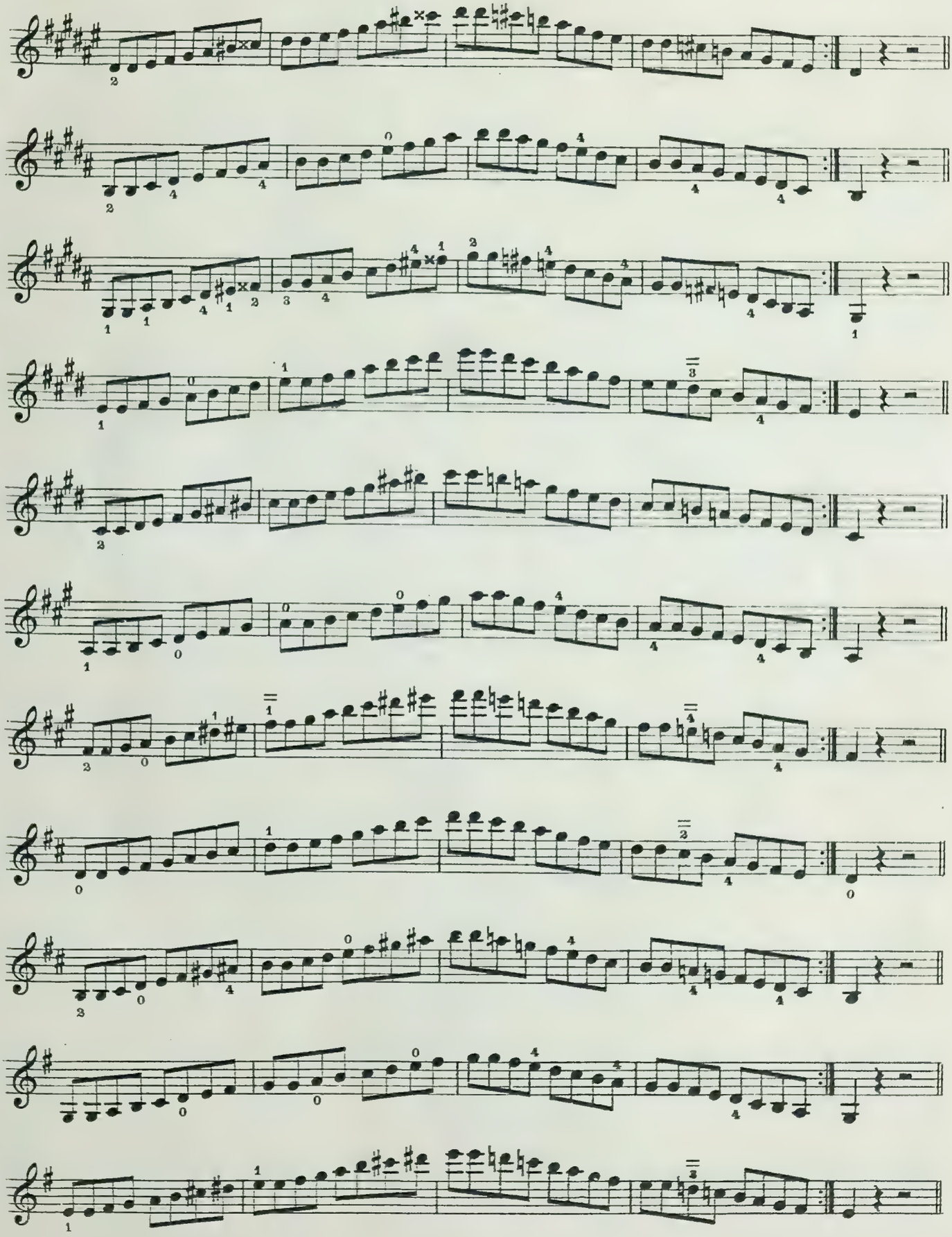
Explanation of signs used in this book

⊓ - Down bow
V = Up bow
– = On the first or E string
= = On the A string
≡ = On the D string
≣ = On the G string

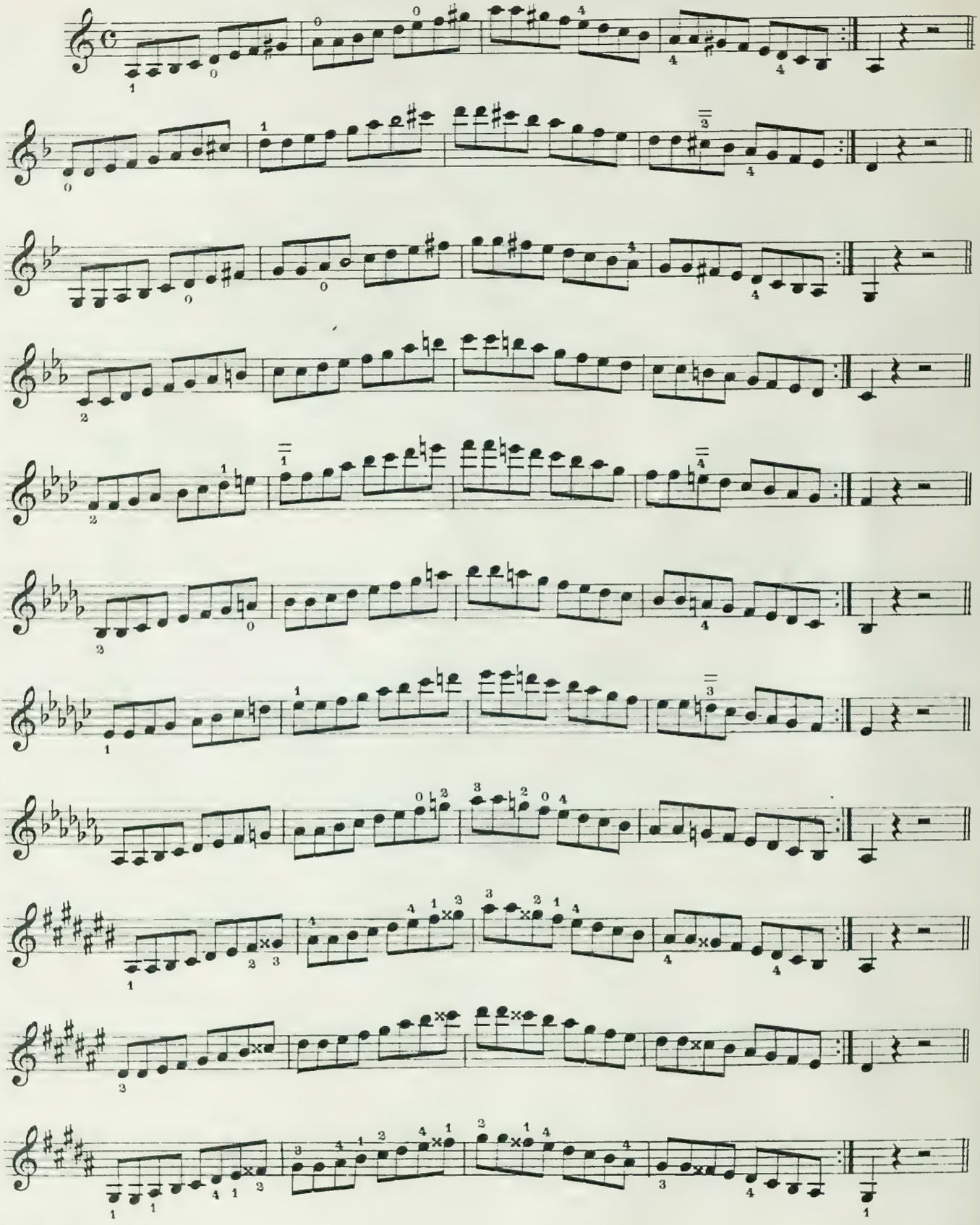
Major and Melodic-minor Scales

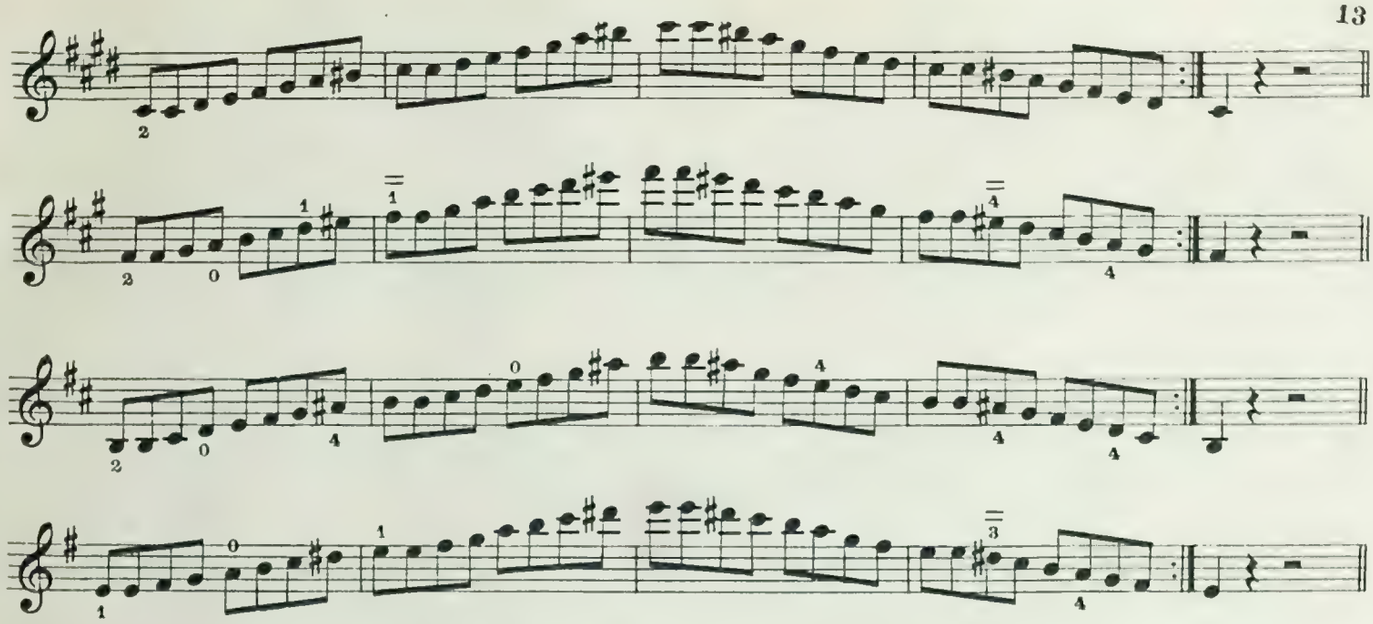




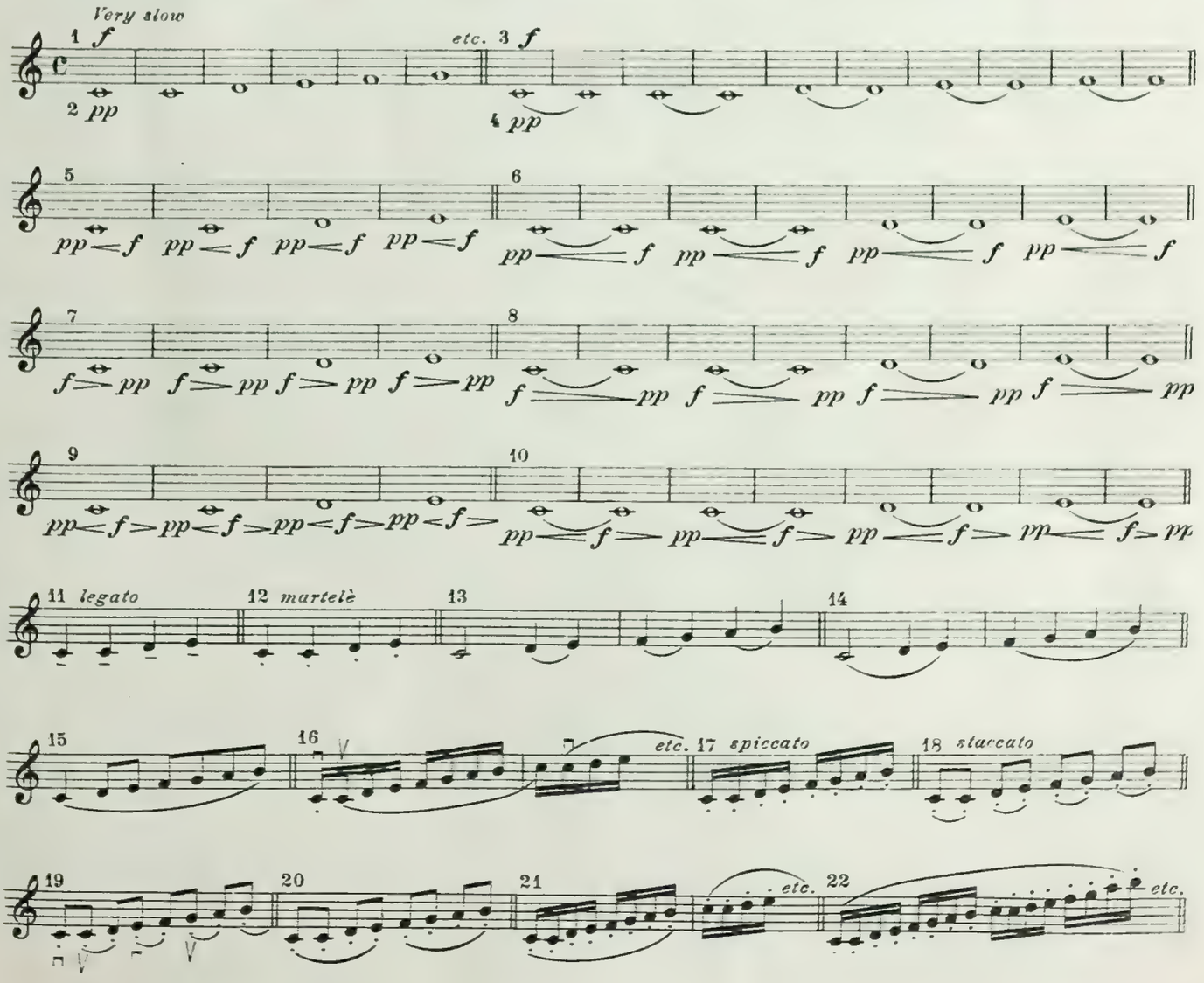


Harmonic-minor Scales



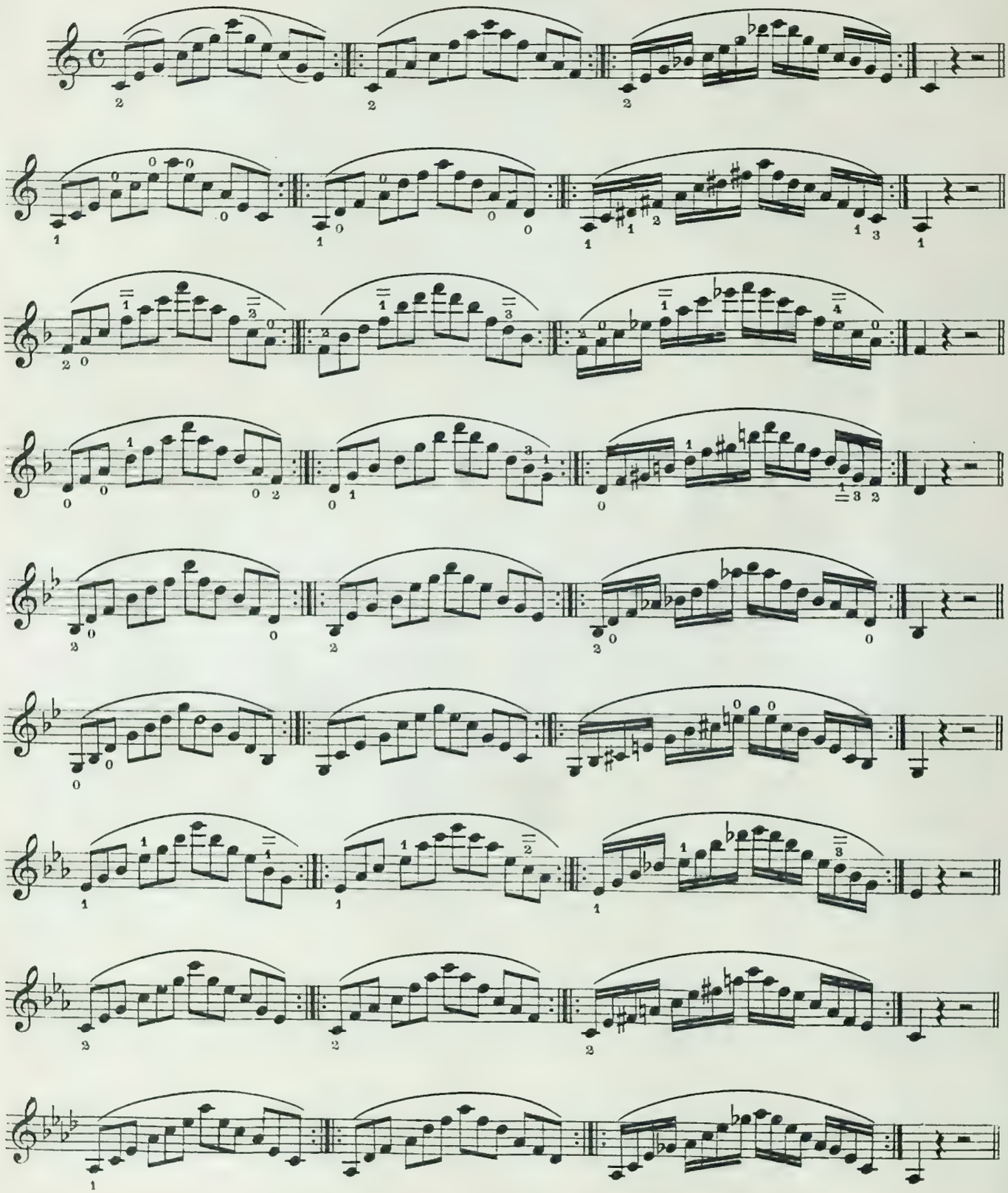


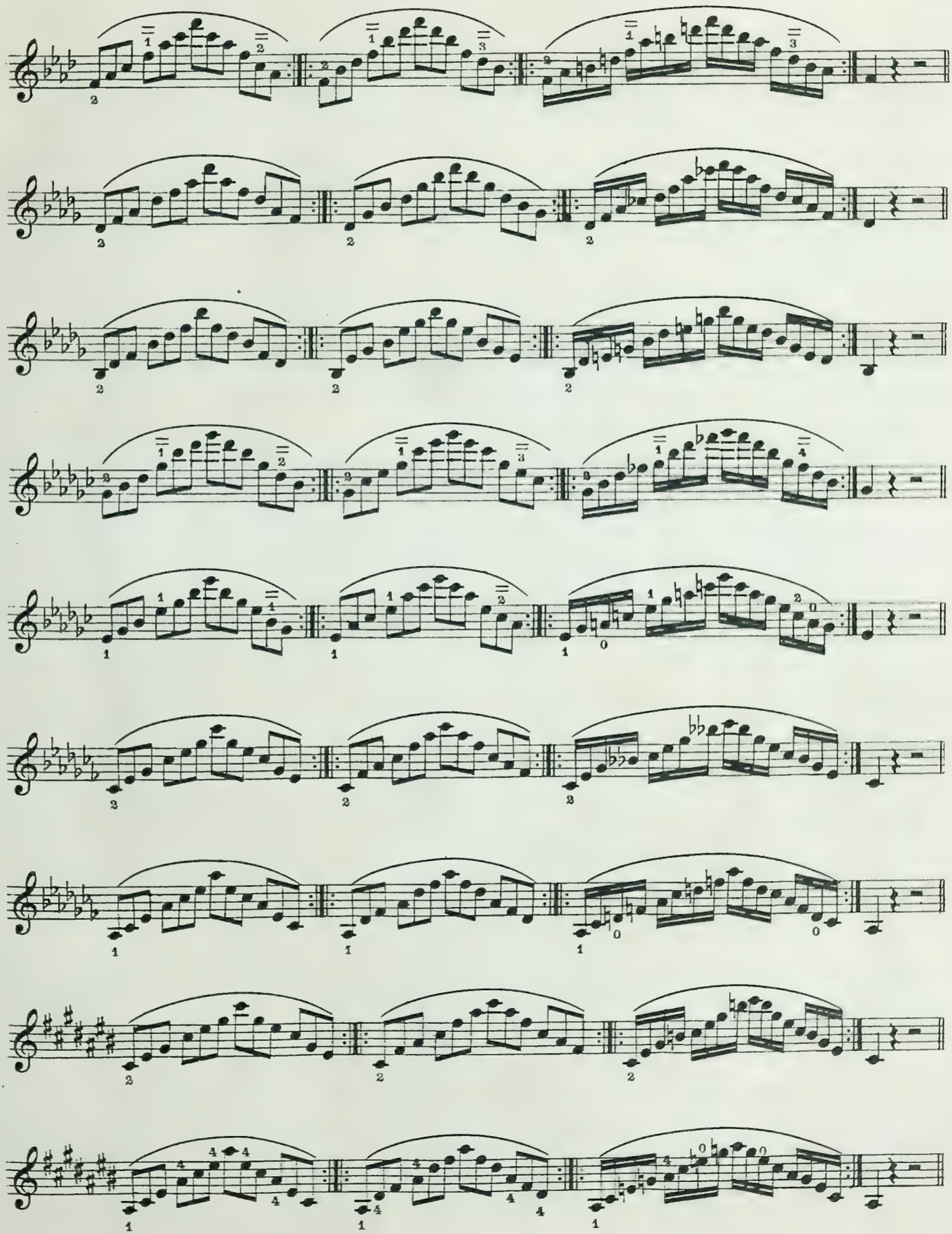
Practice all foregoing scales also in the following manner:

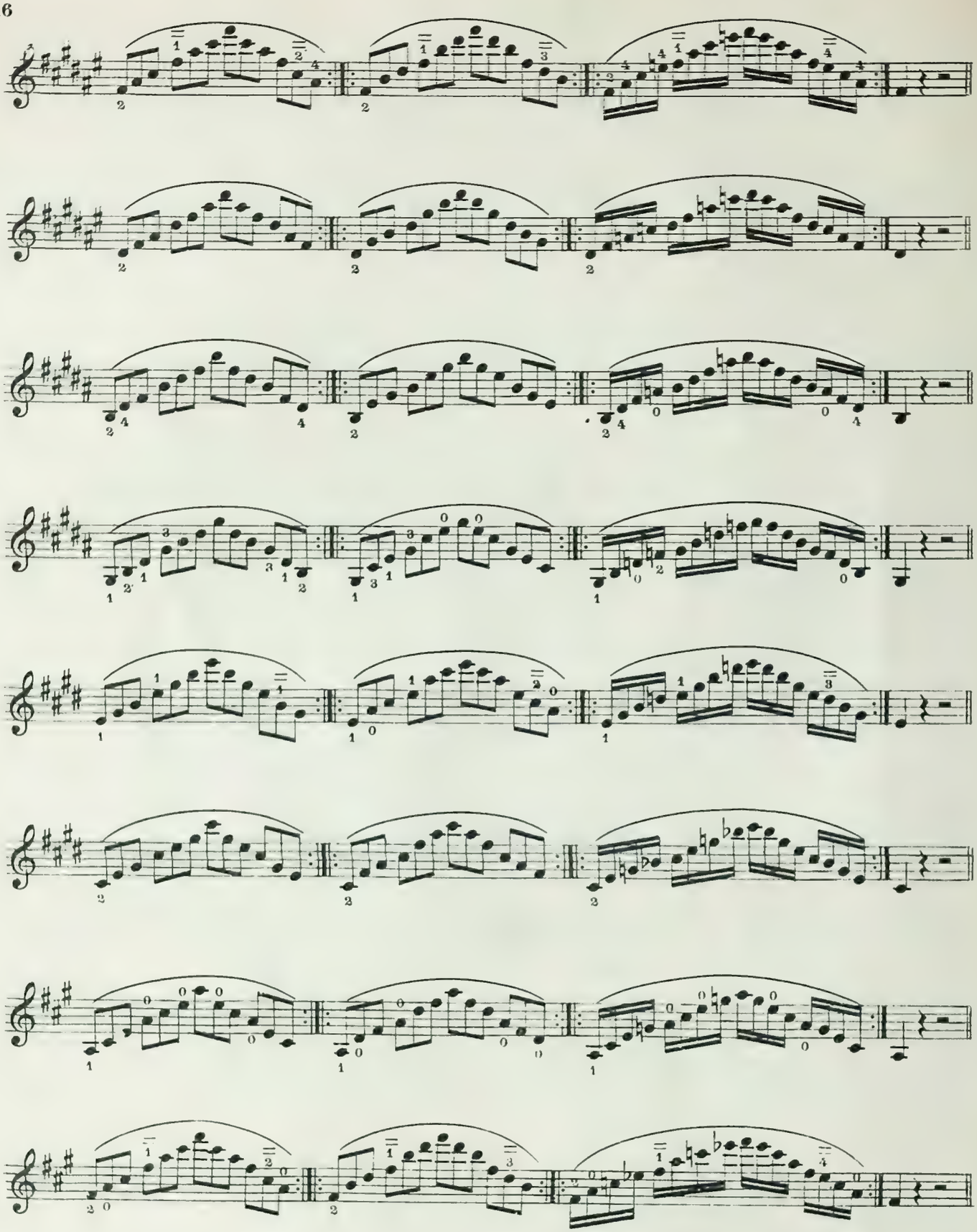


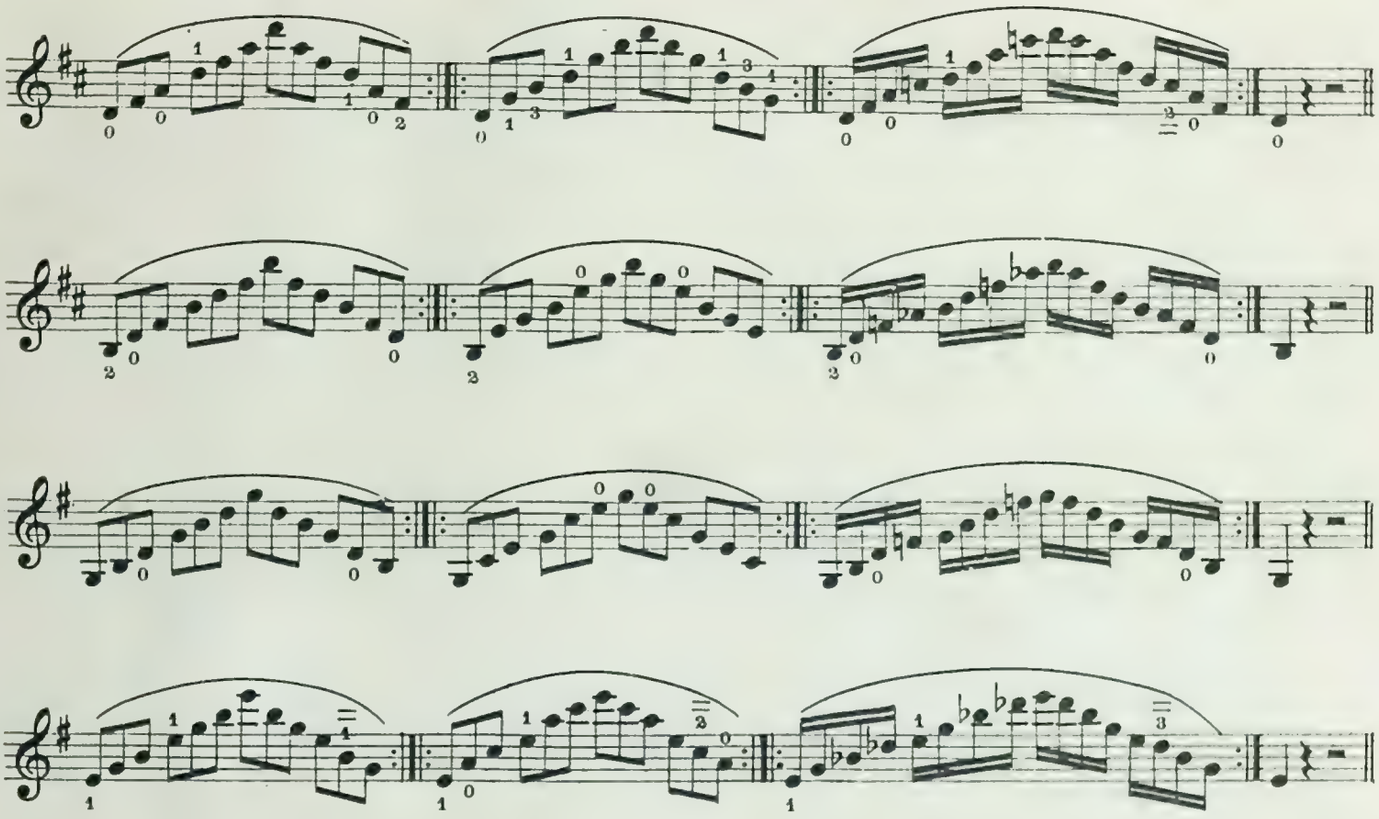
Chord-studies

To be practiced in conjunction with the foregoing scales

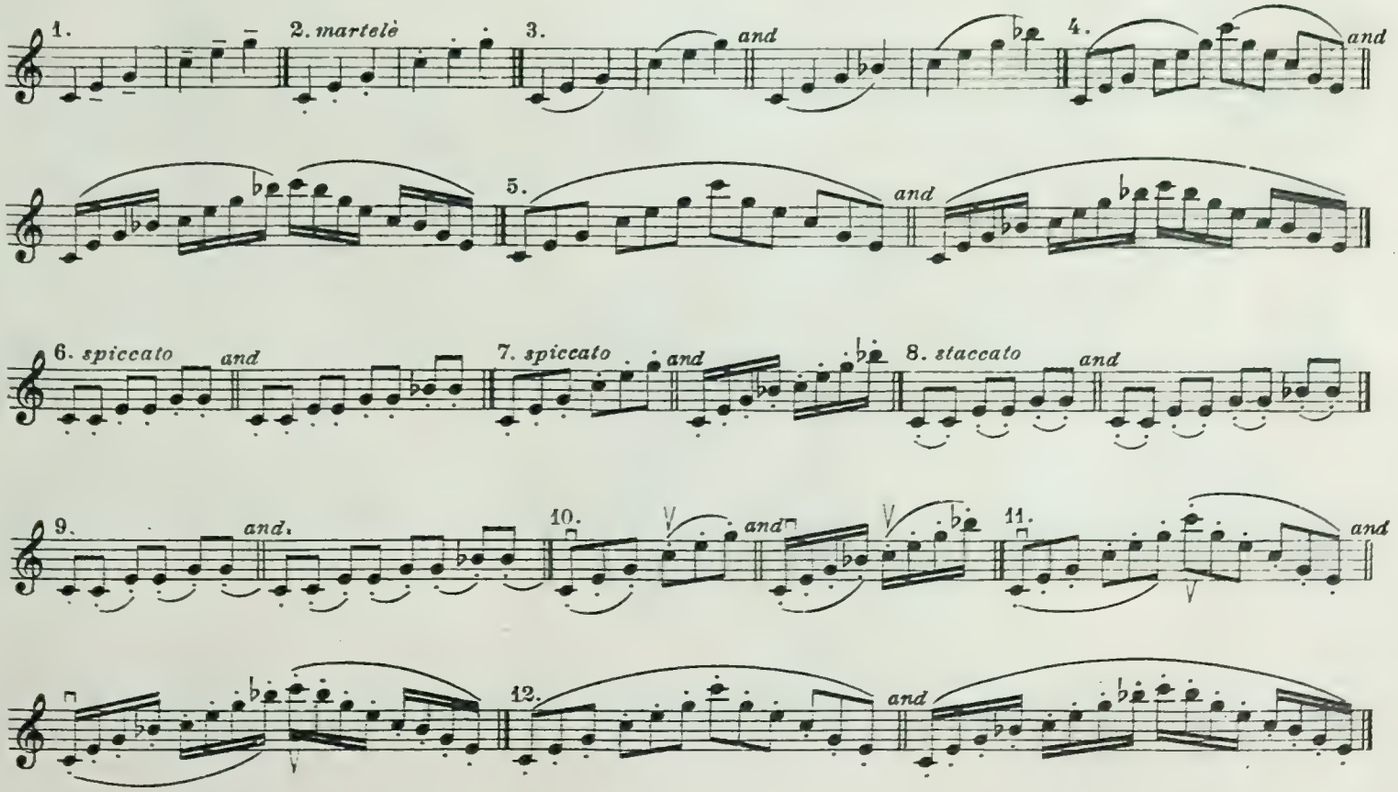




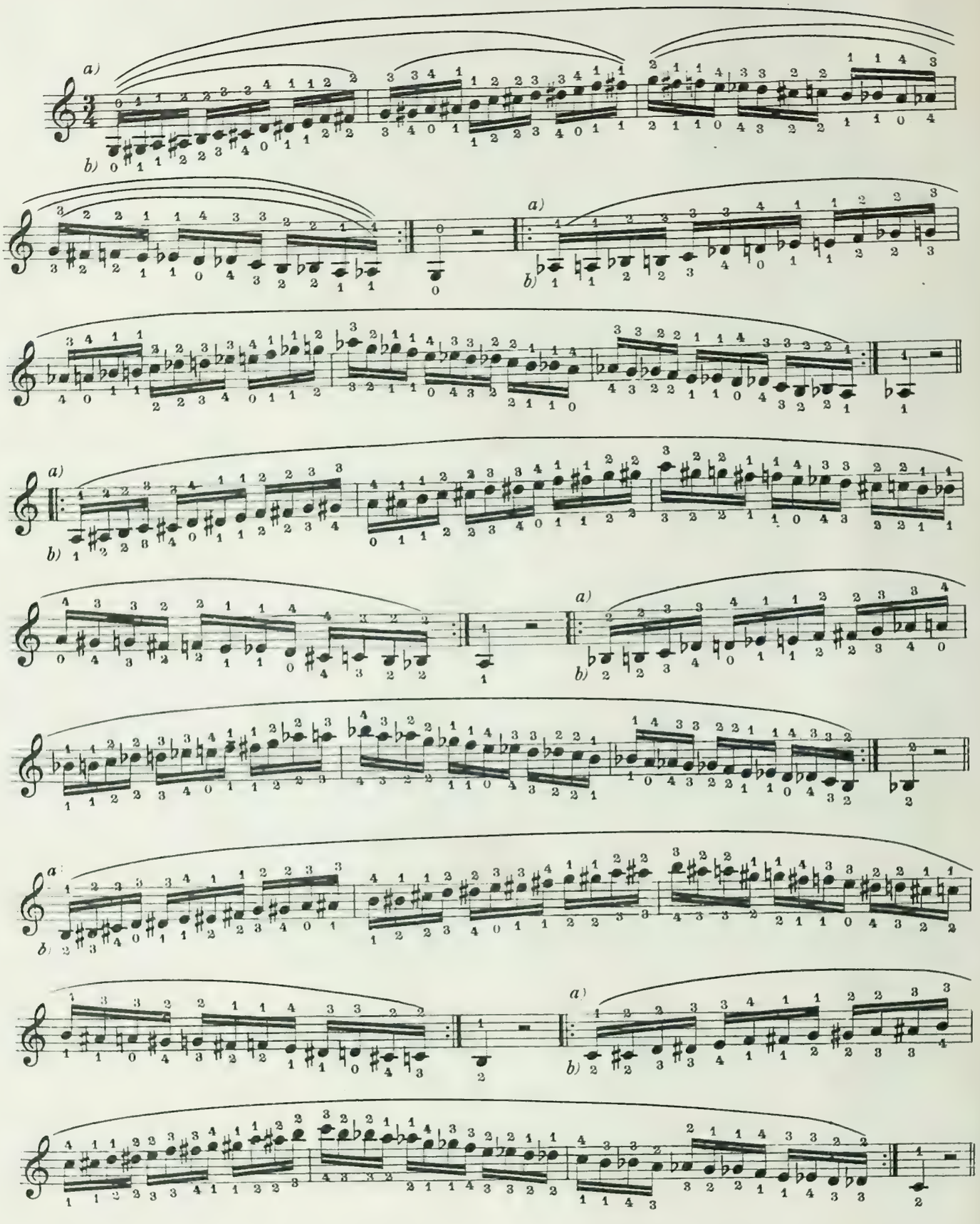


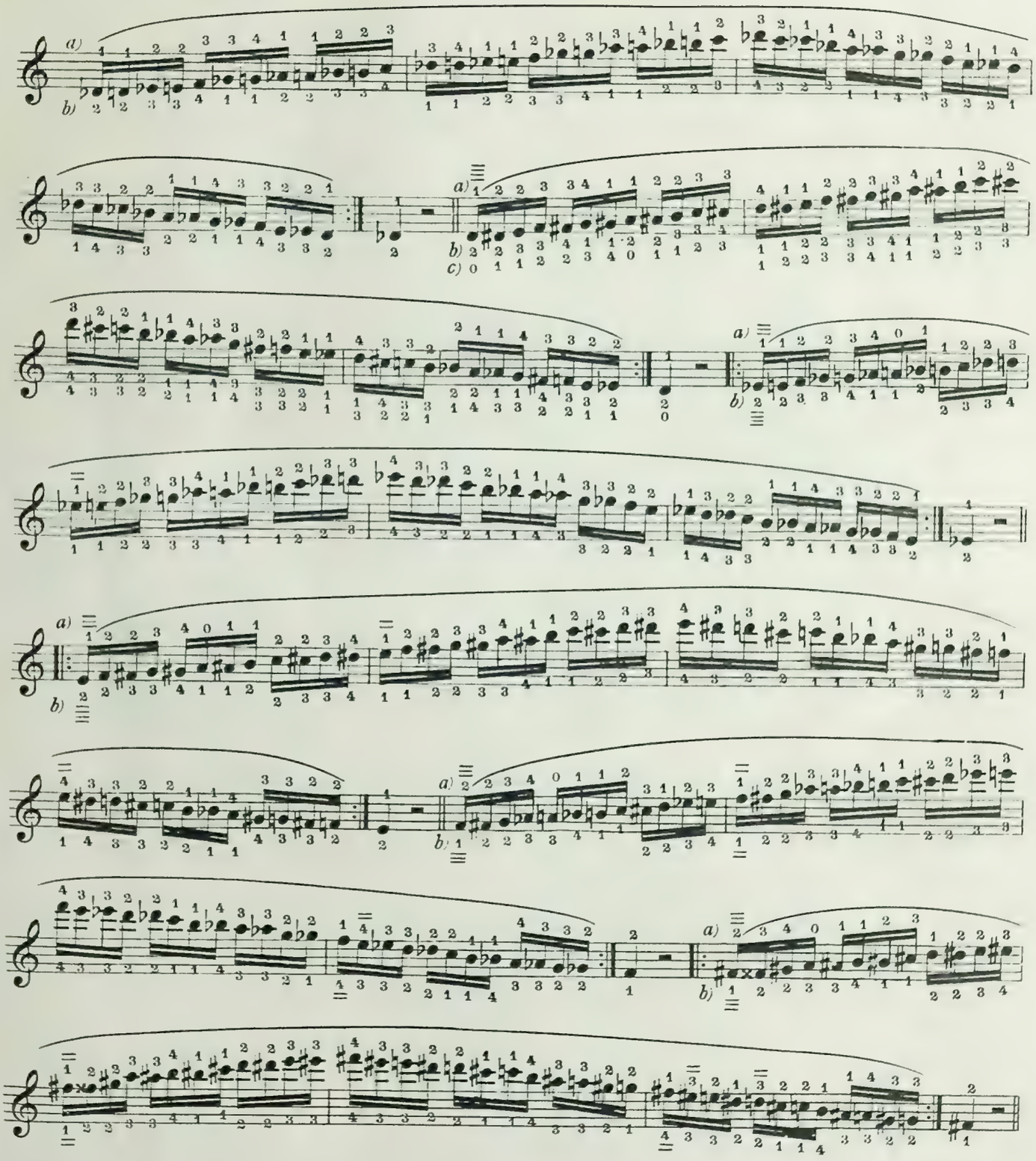


Practice the chord-studies also in the following manner:

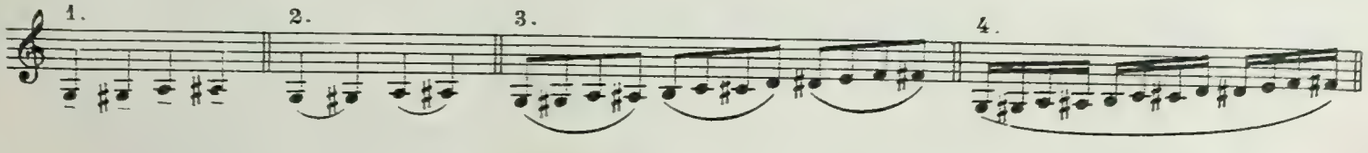


Chromatic Scales





Practice chromatic scales in the following manner:



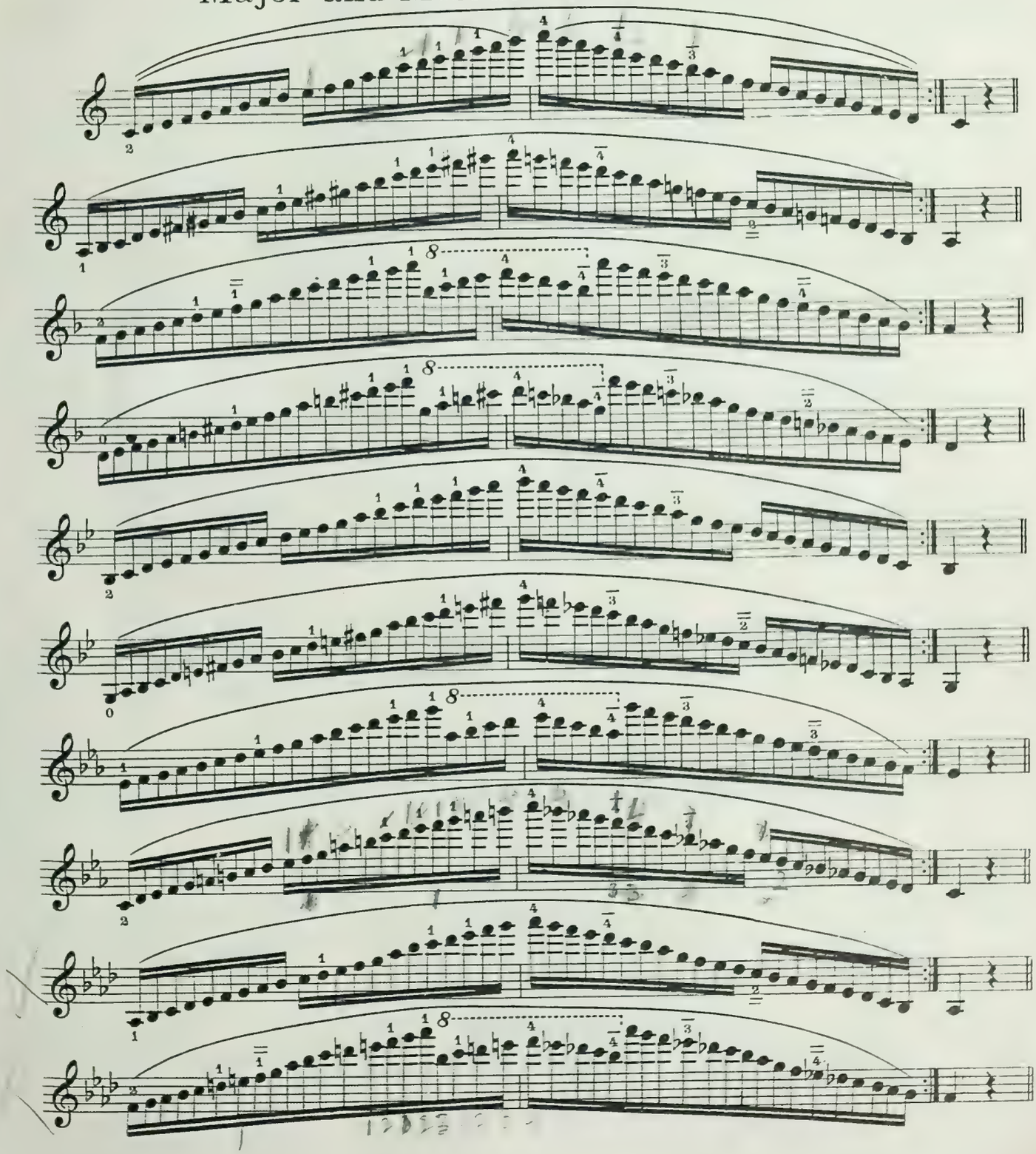
PART II

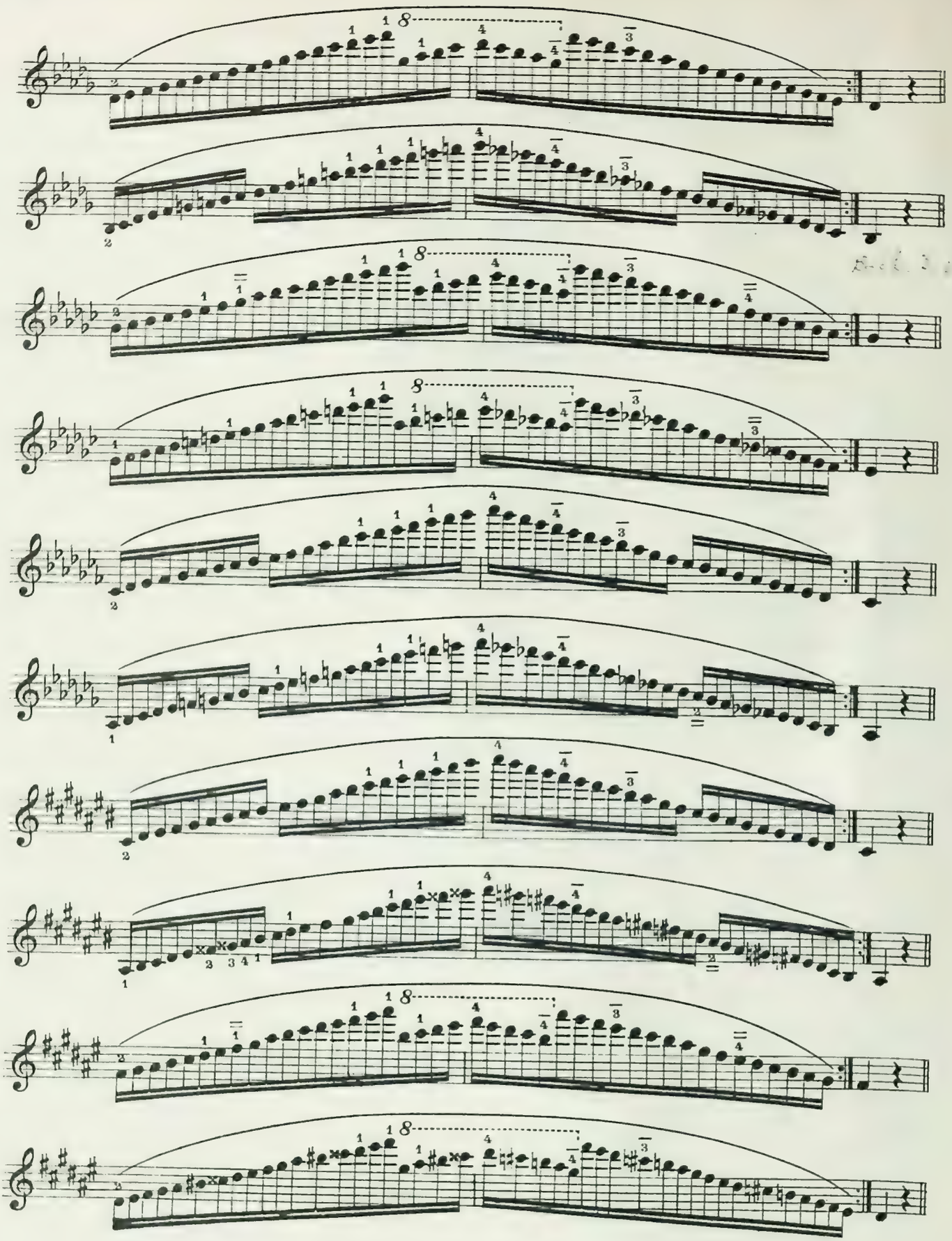
THE DIATONIC SCALES, CHORD-STUDIES AND CHROMATIC SCALES IN THREE OCTAVES

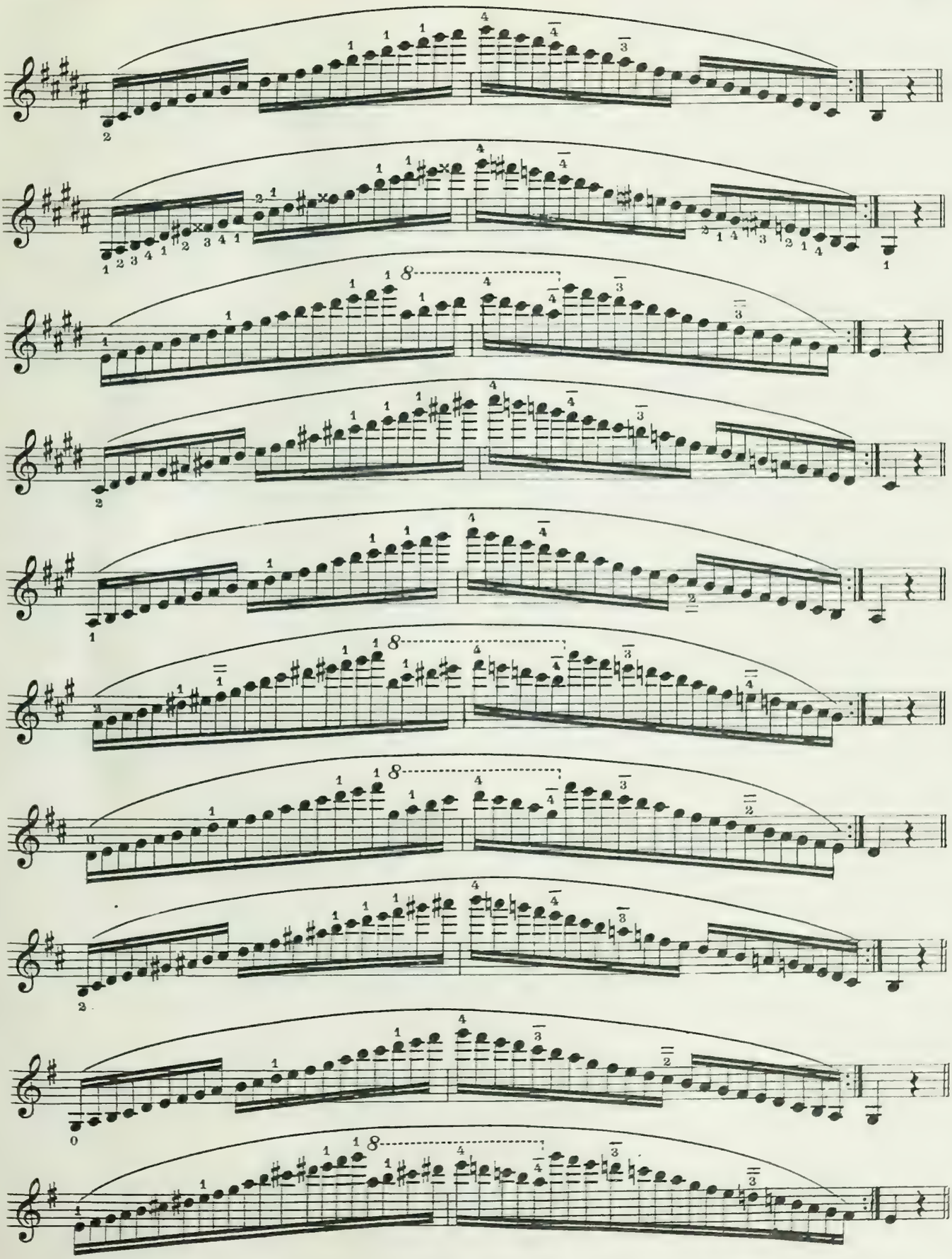
PART II

THE DIATONIC SCALES, CHORD-STUDIES AND CHROMATIC SCALES IN THREE OCTAVES

Major-and Melodic-minor Scales



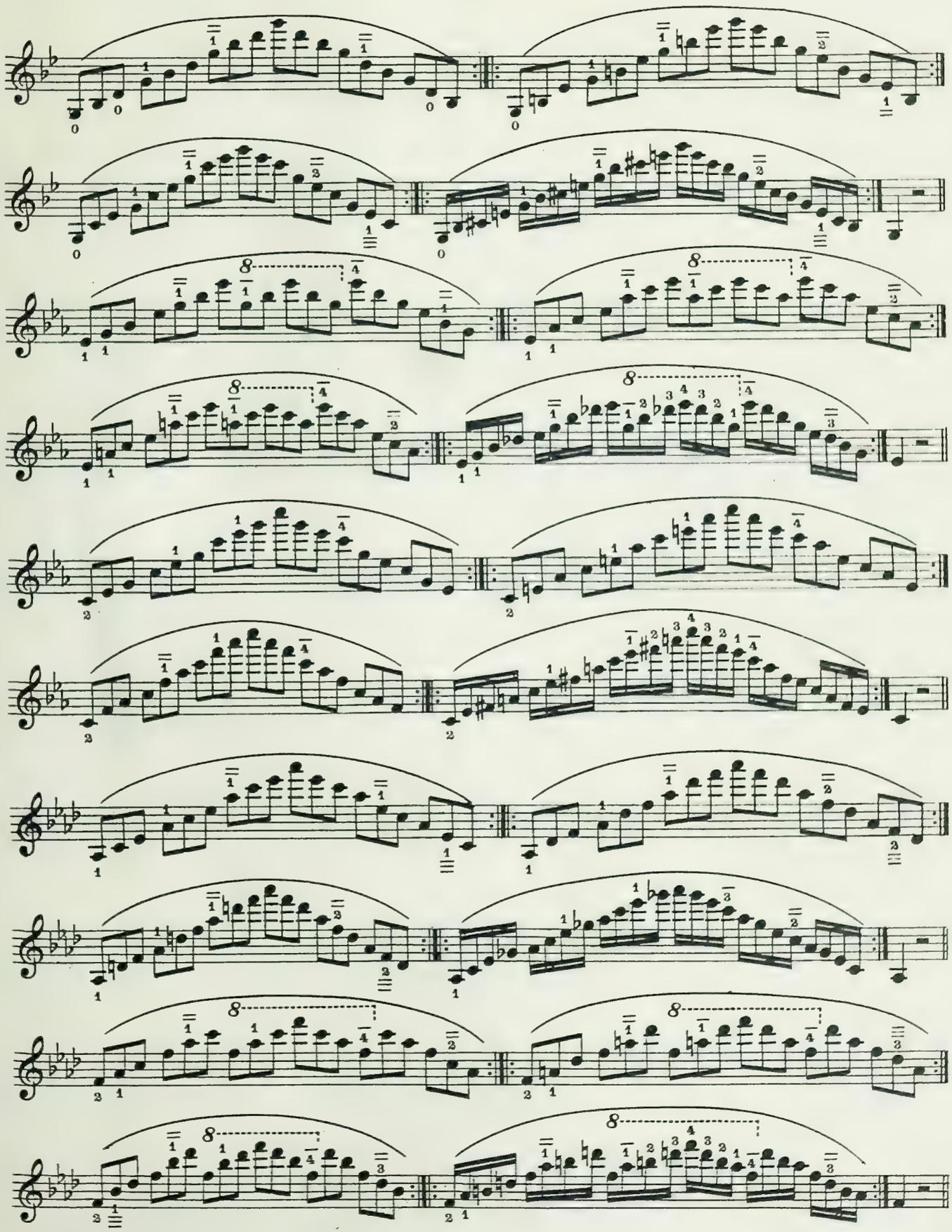


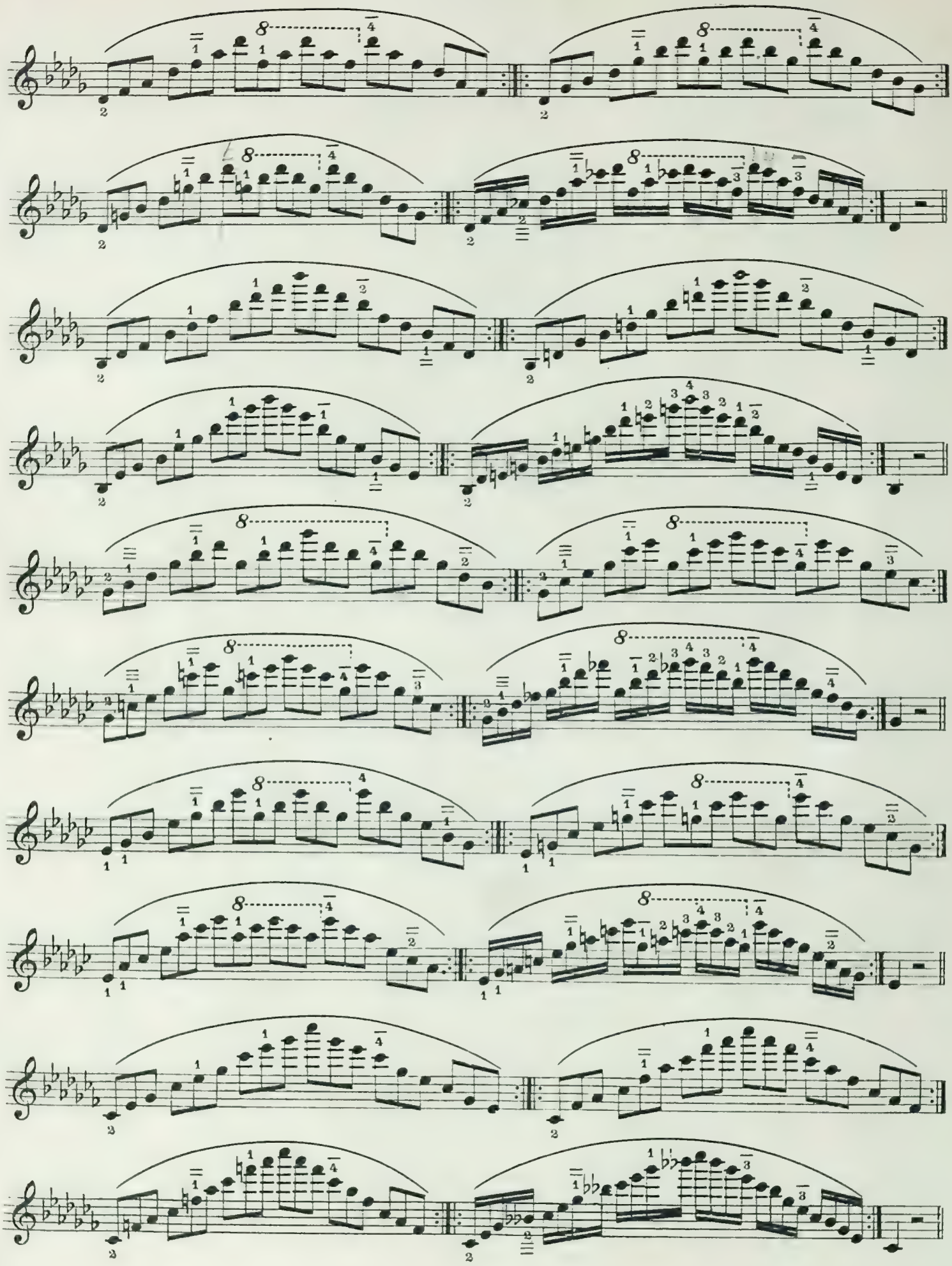


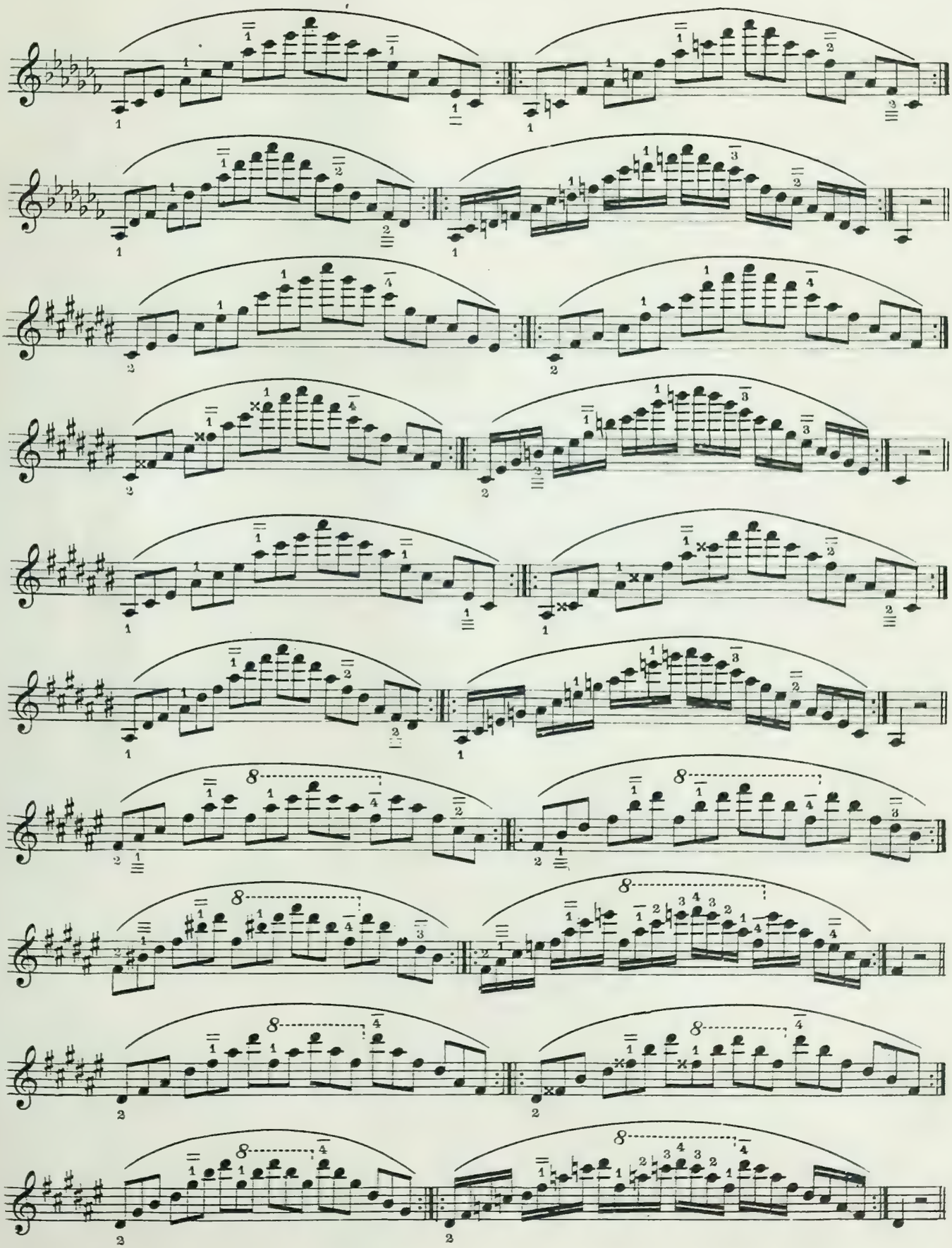
Practice the Harmonic-minor Scales with the same fingering indicated for the Melodic-minor Scales.

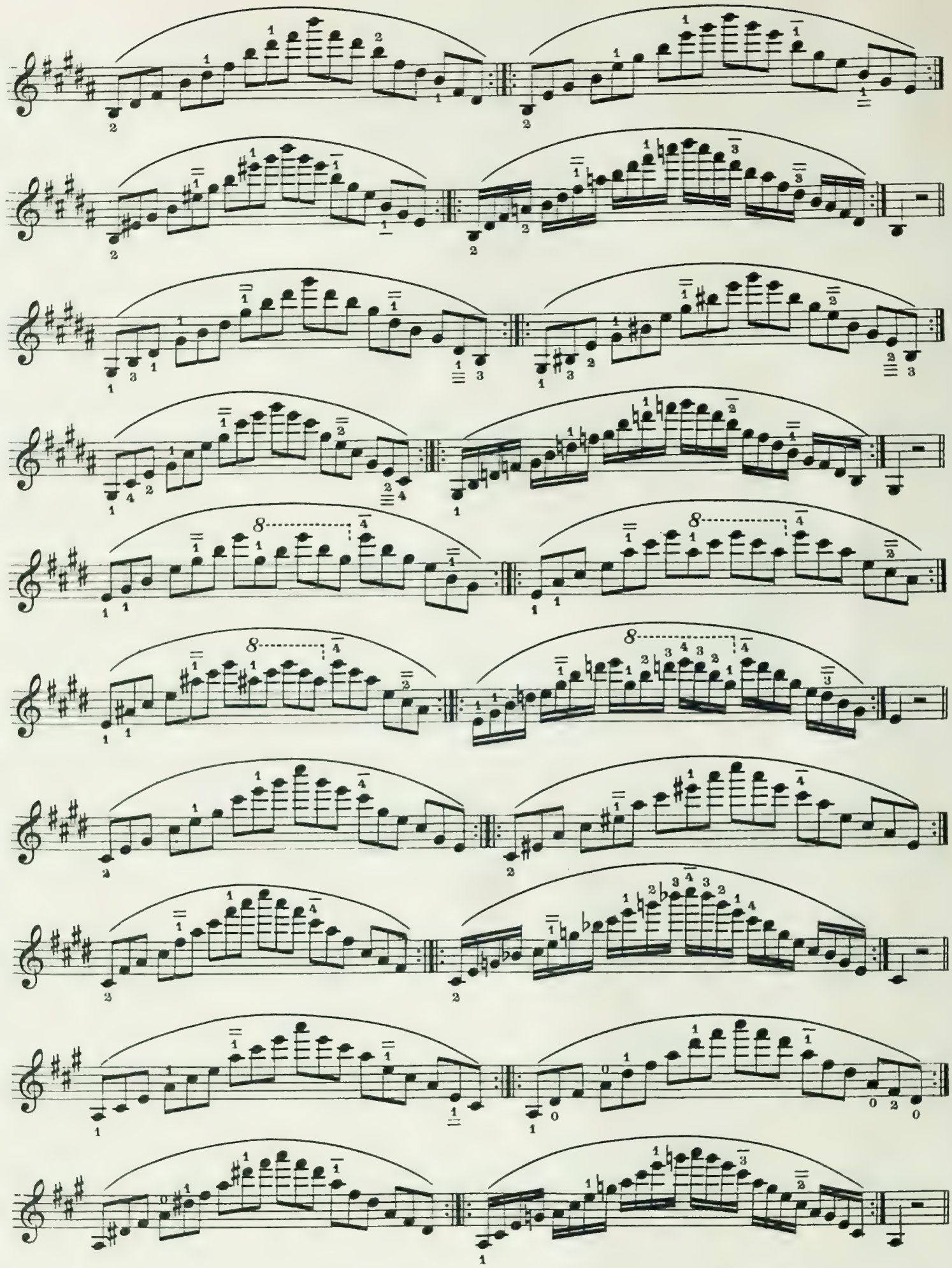
Scales & Chord Stud.

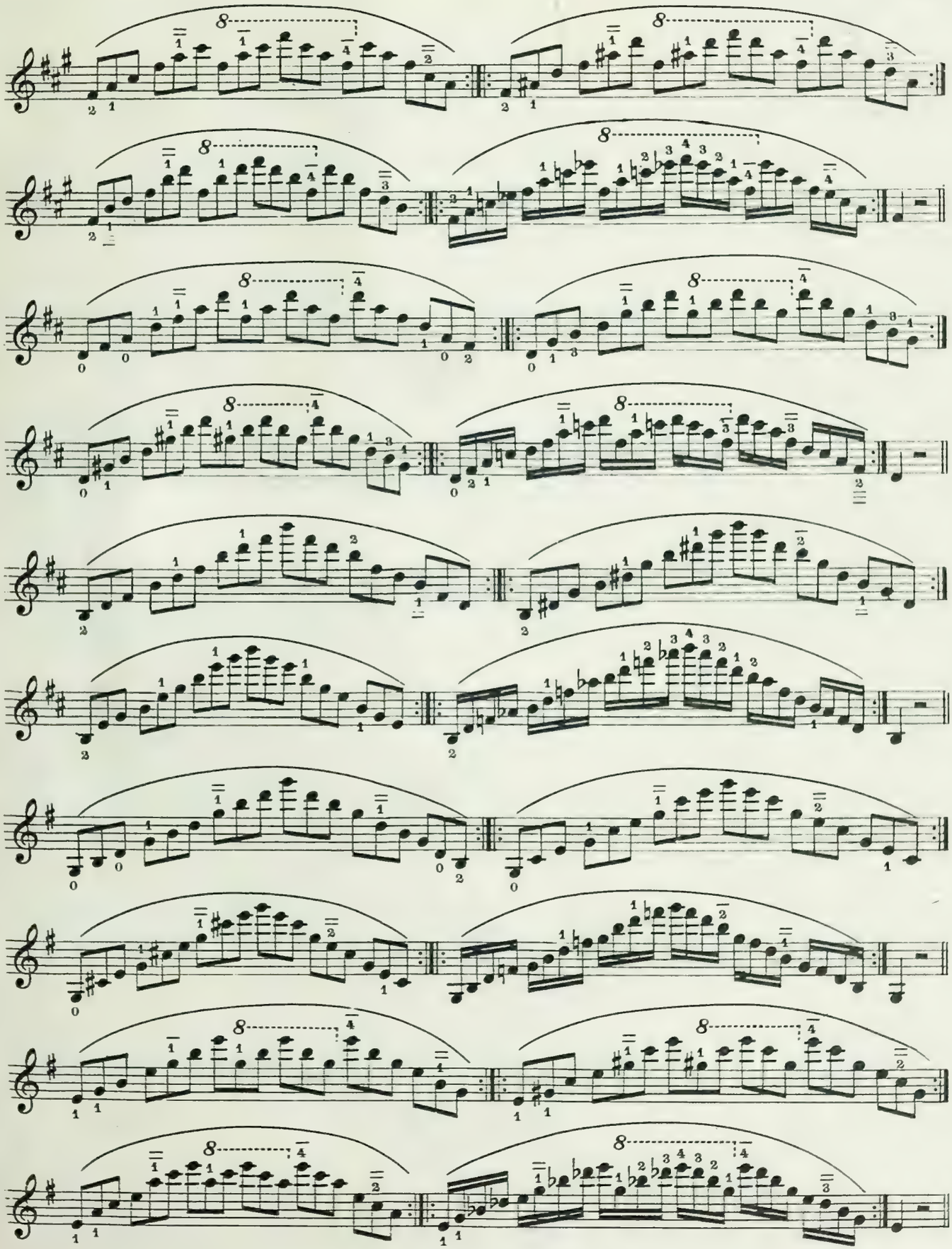
Chord-studies



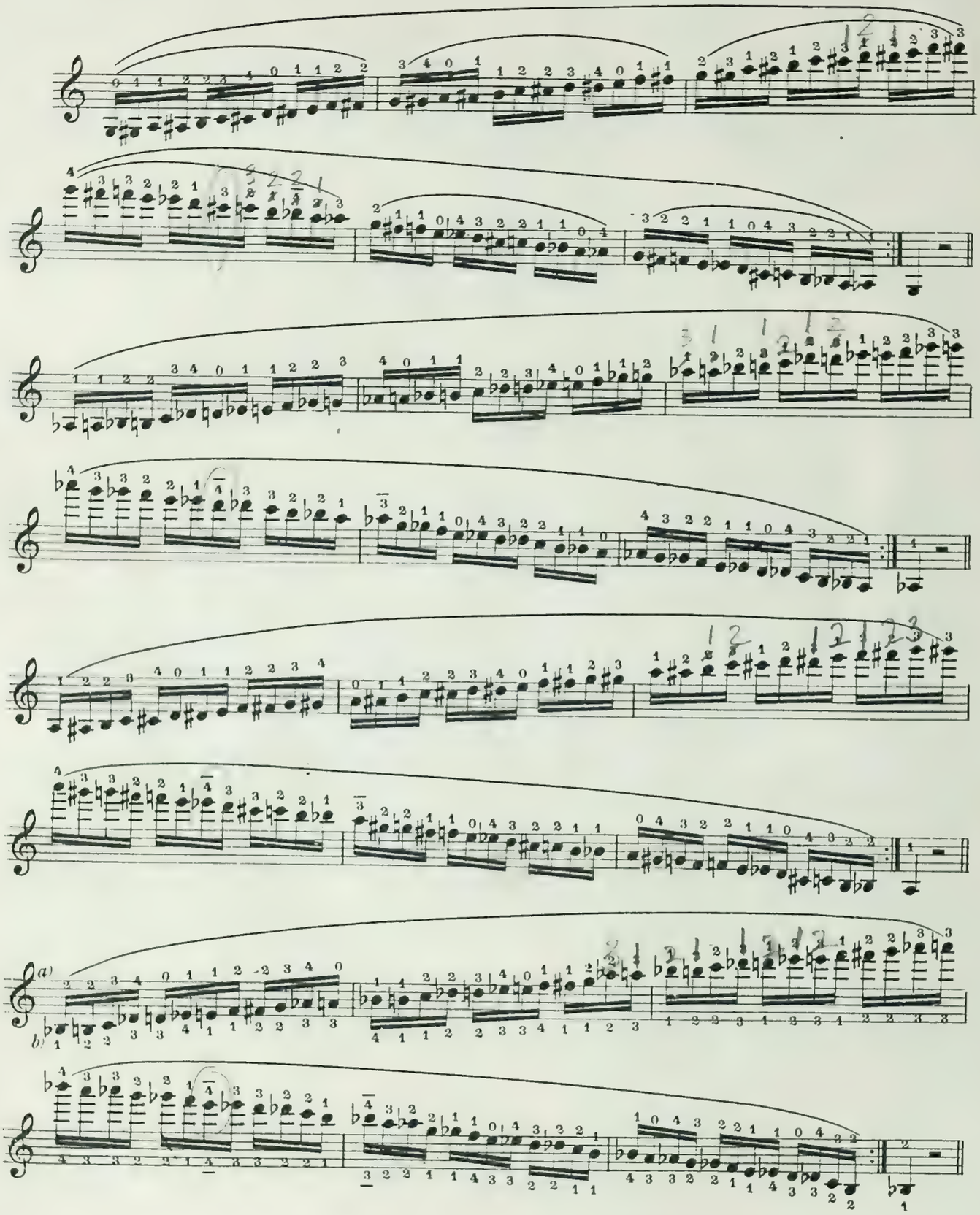


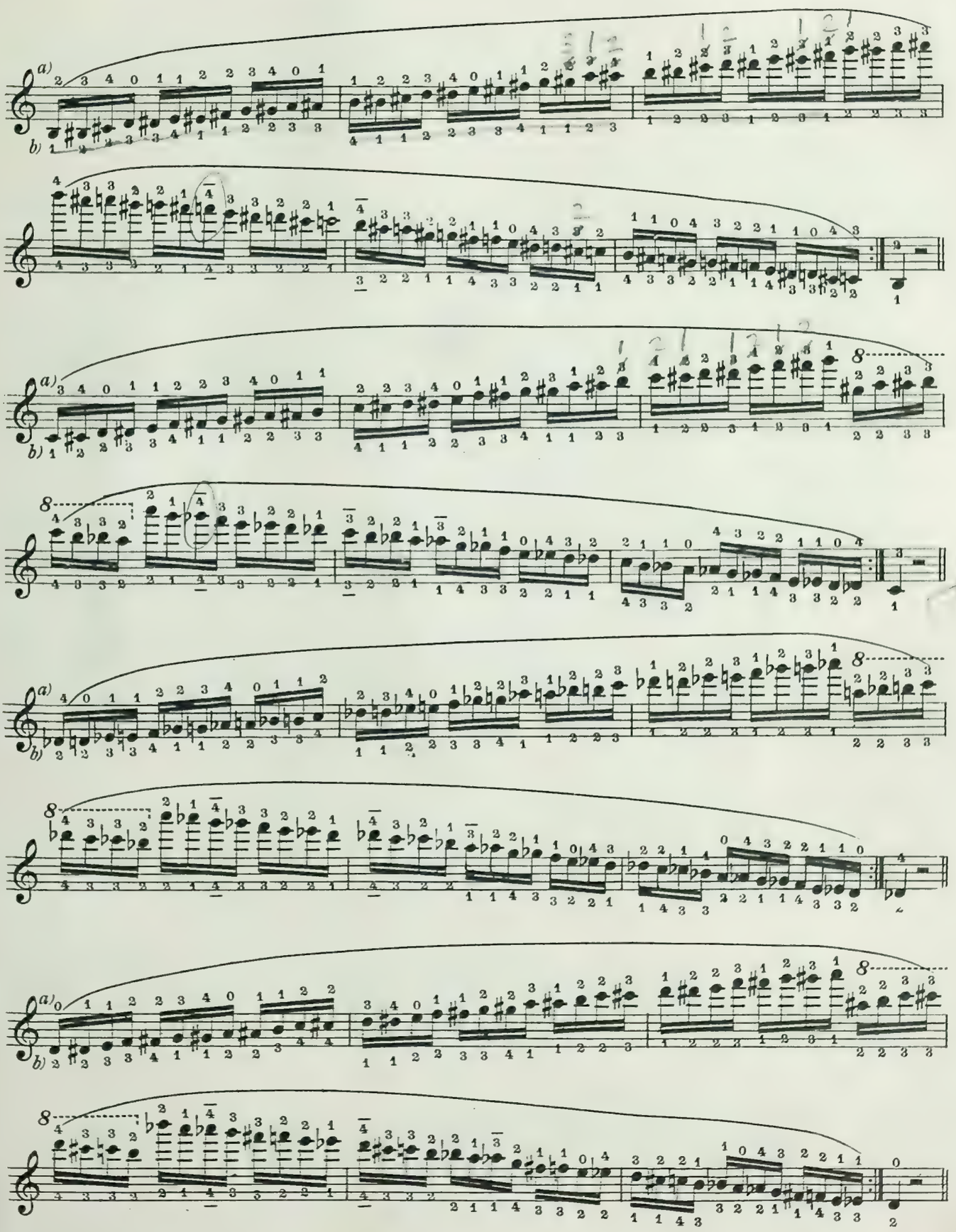


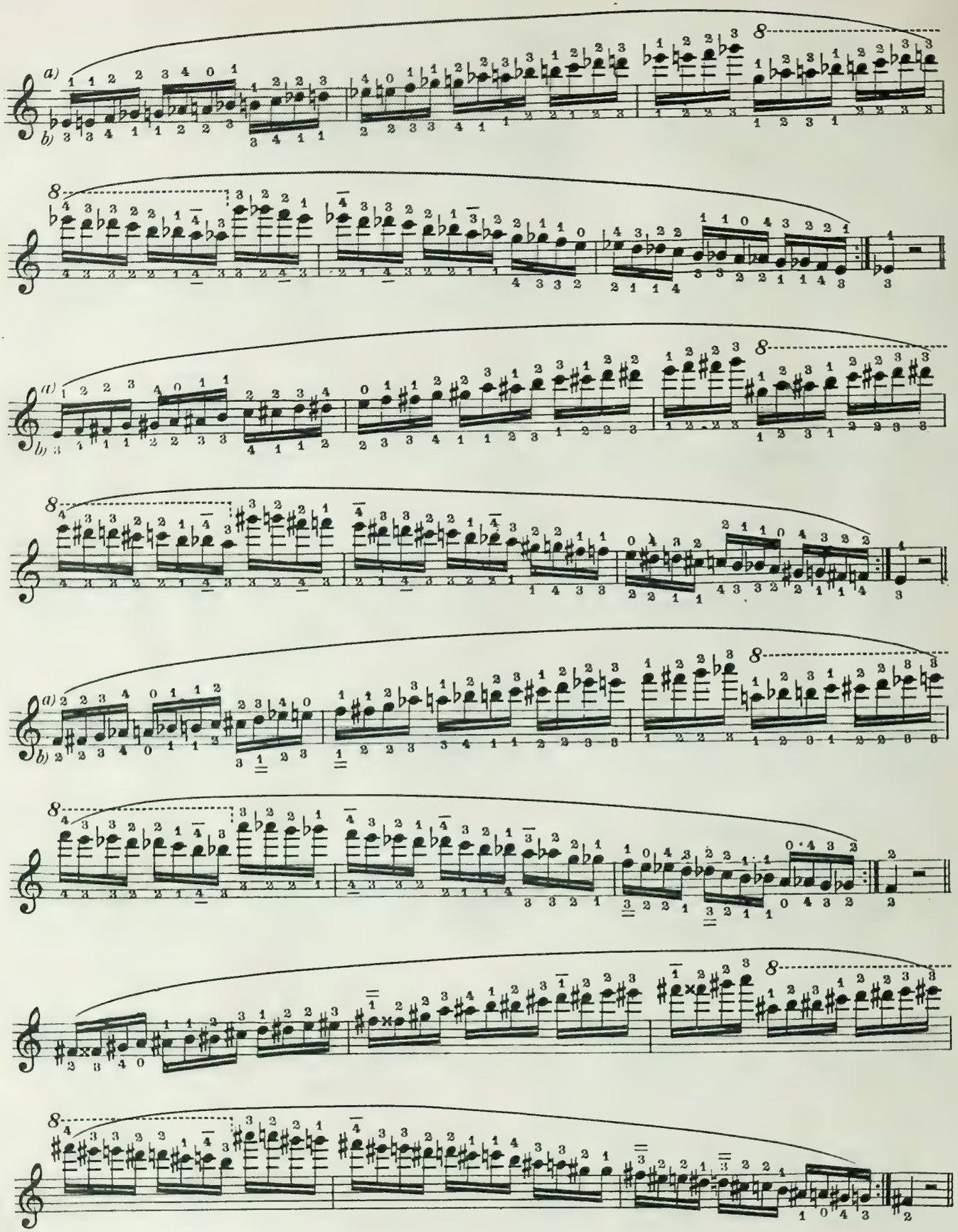




Chromatic Scales




a)
b)
8



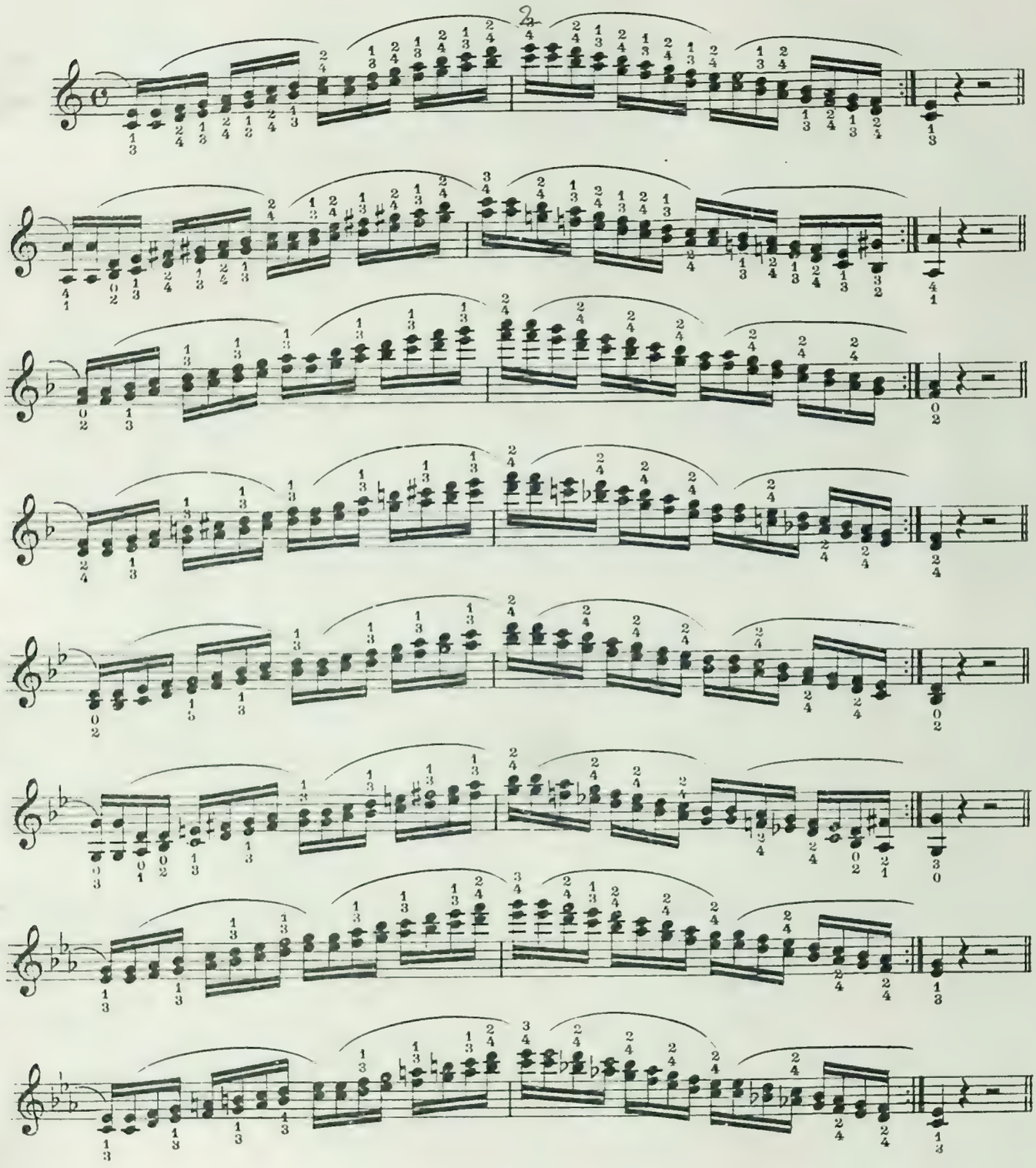
PART III

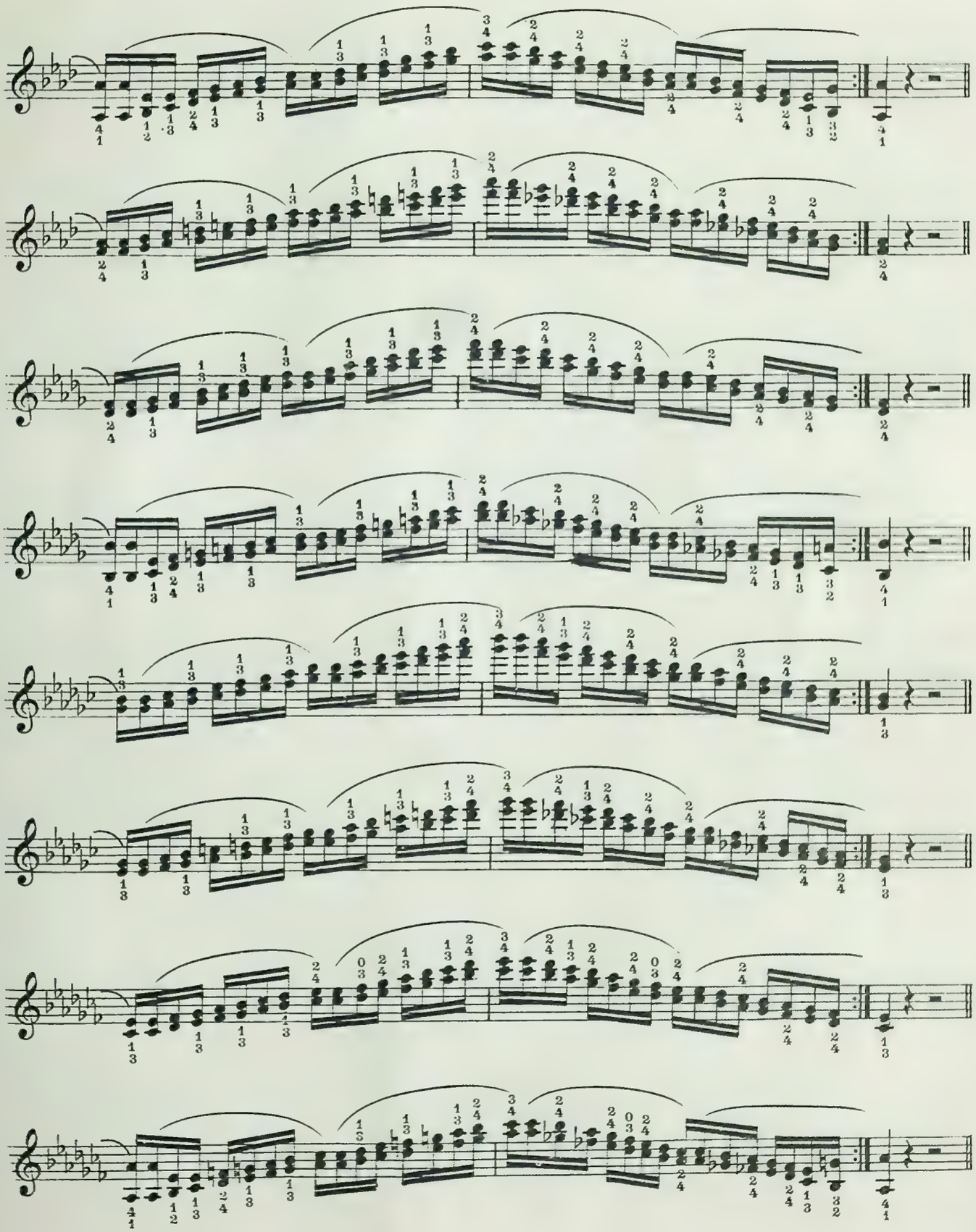
THE MAJOR- AND MELODIC- MINOR SCALES IN DOUBLE- STOPS

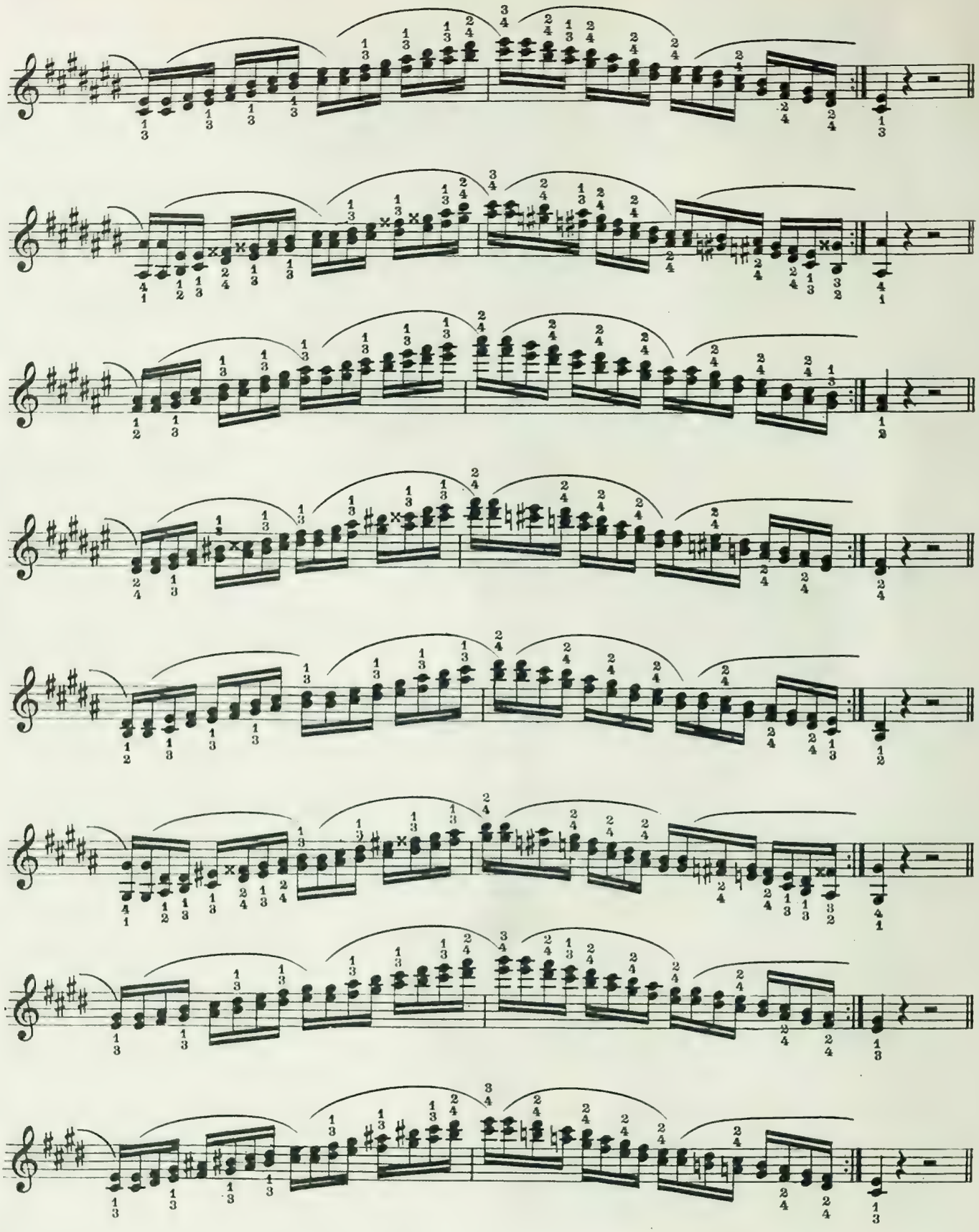
PART III

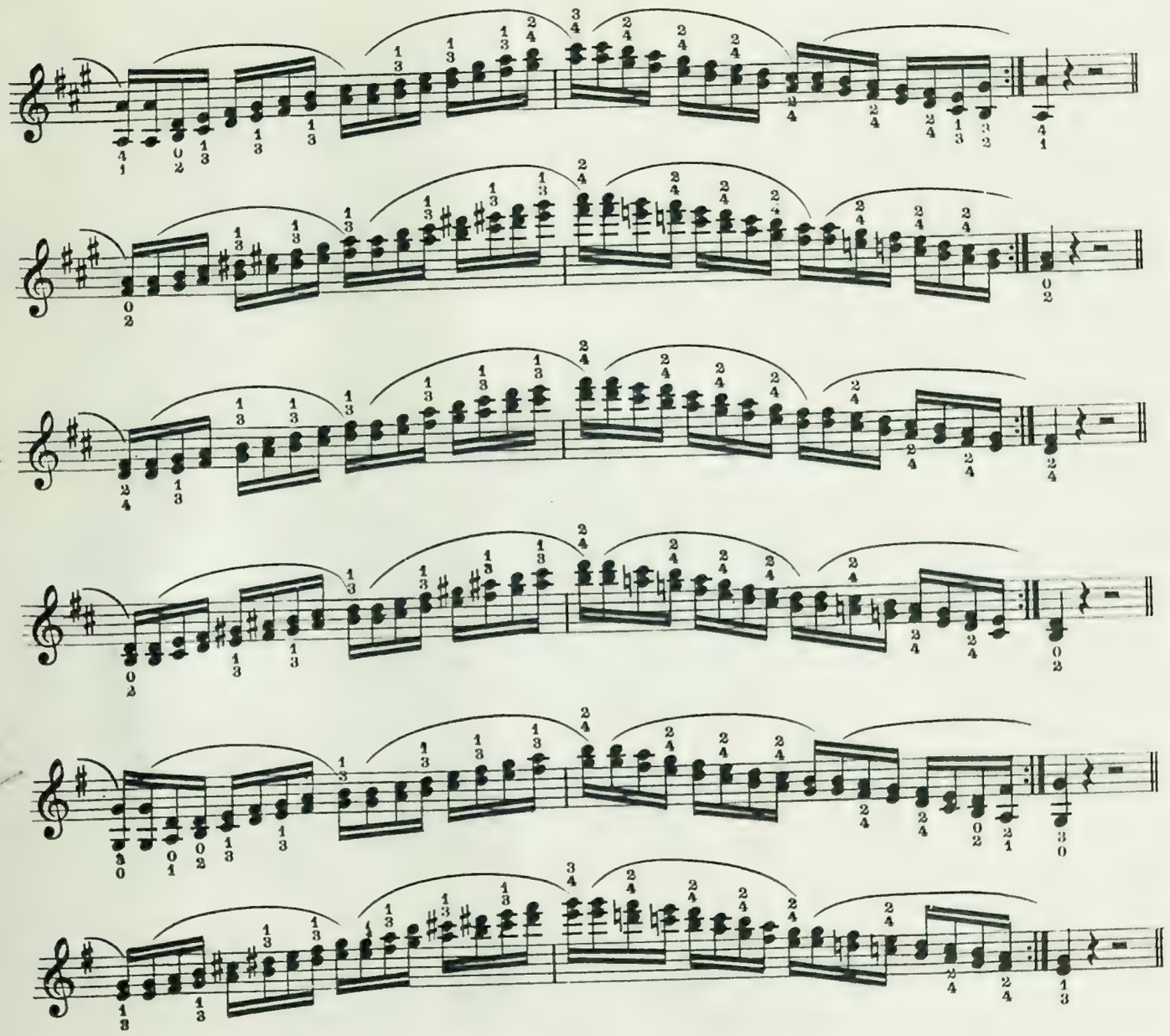
THE MAJOR-AND MELODIC-MINOR SCALES IN DOUBLE-STOPS

Thirds

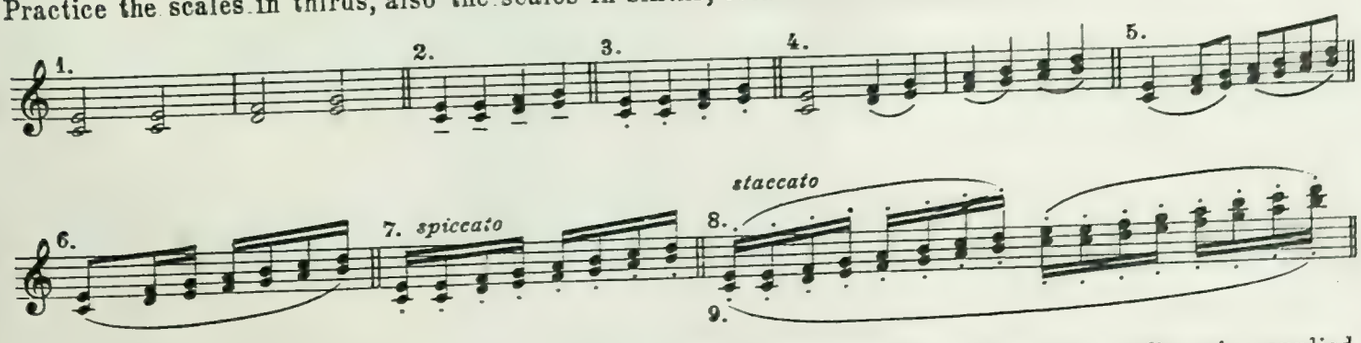






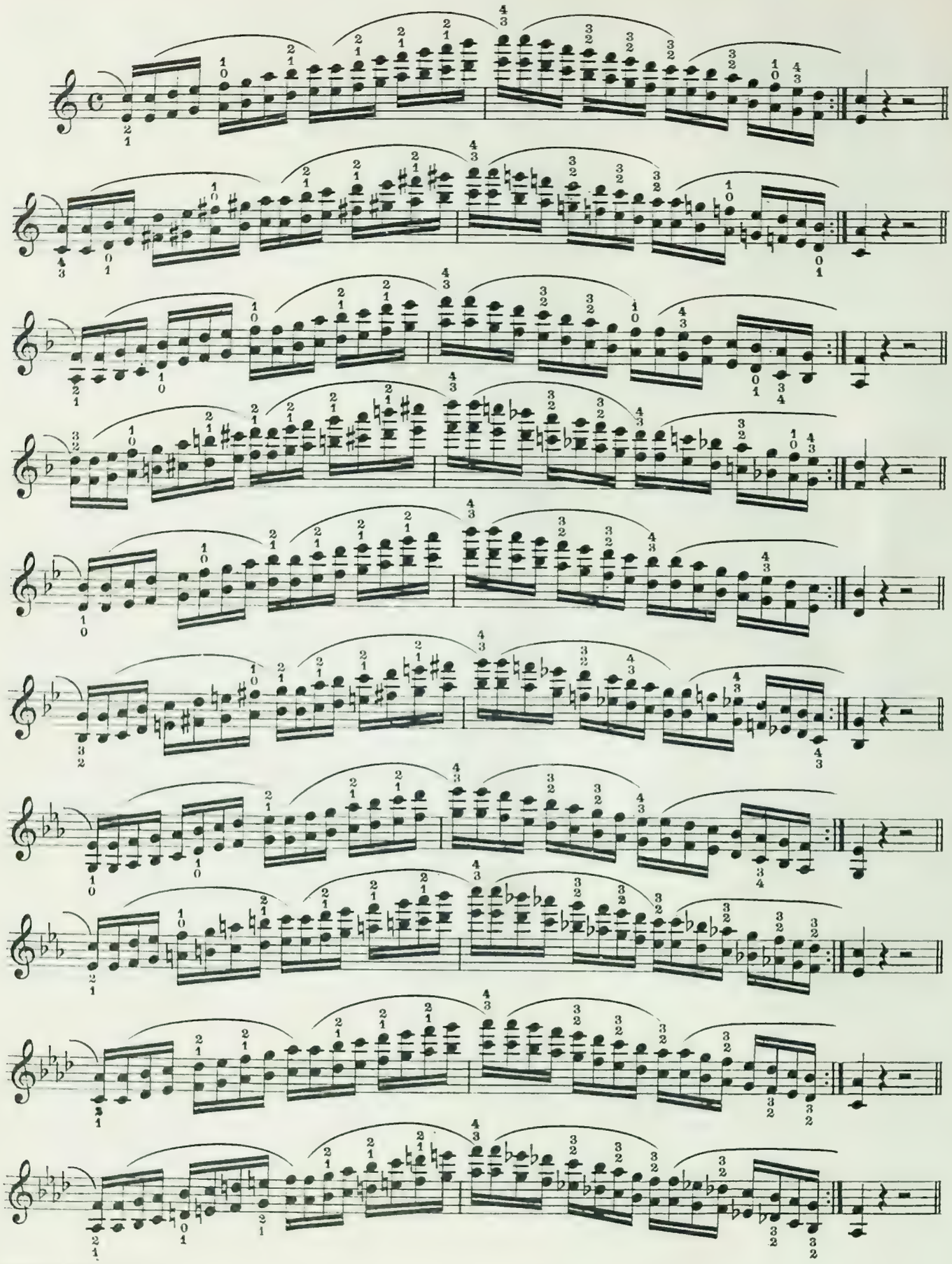


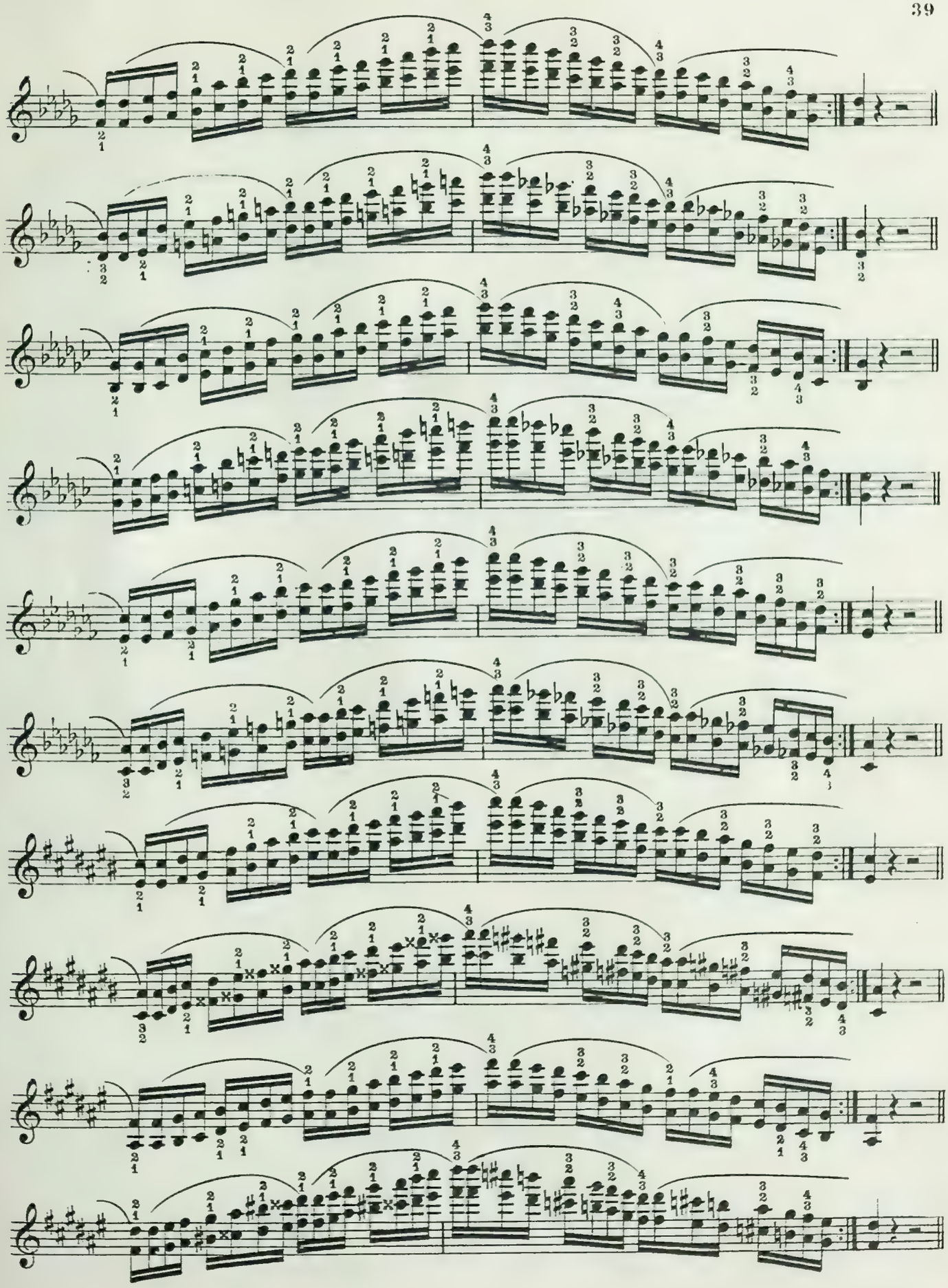
Practice the scales in thirds, also the scales in sixths, octaves and tenths in the following manner:—

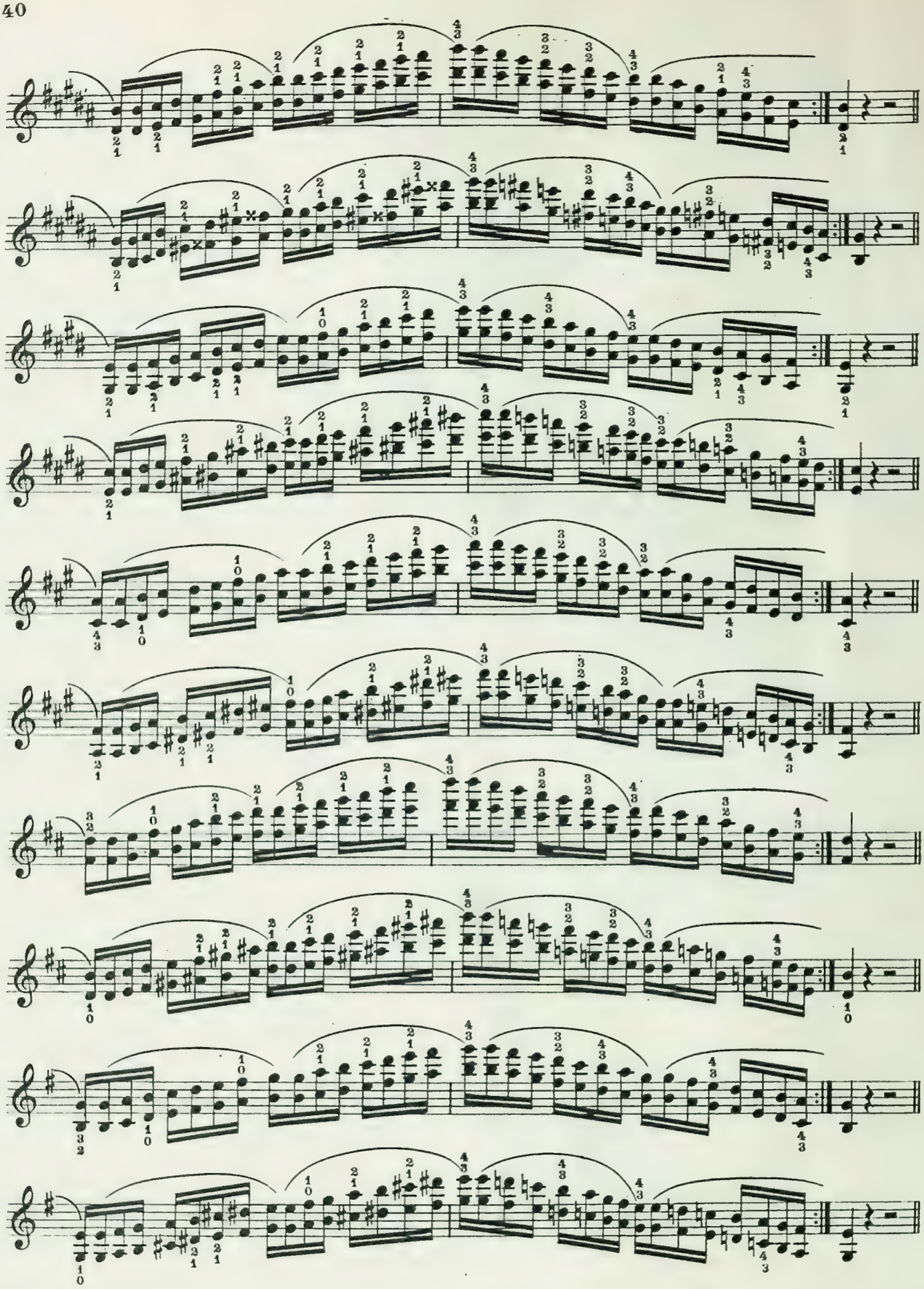


Practice the harmonic minor scales also in thirds, sixths, octaves and tenths; use the same fingering applied here for the melodic minor scales.

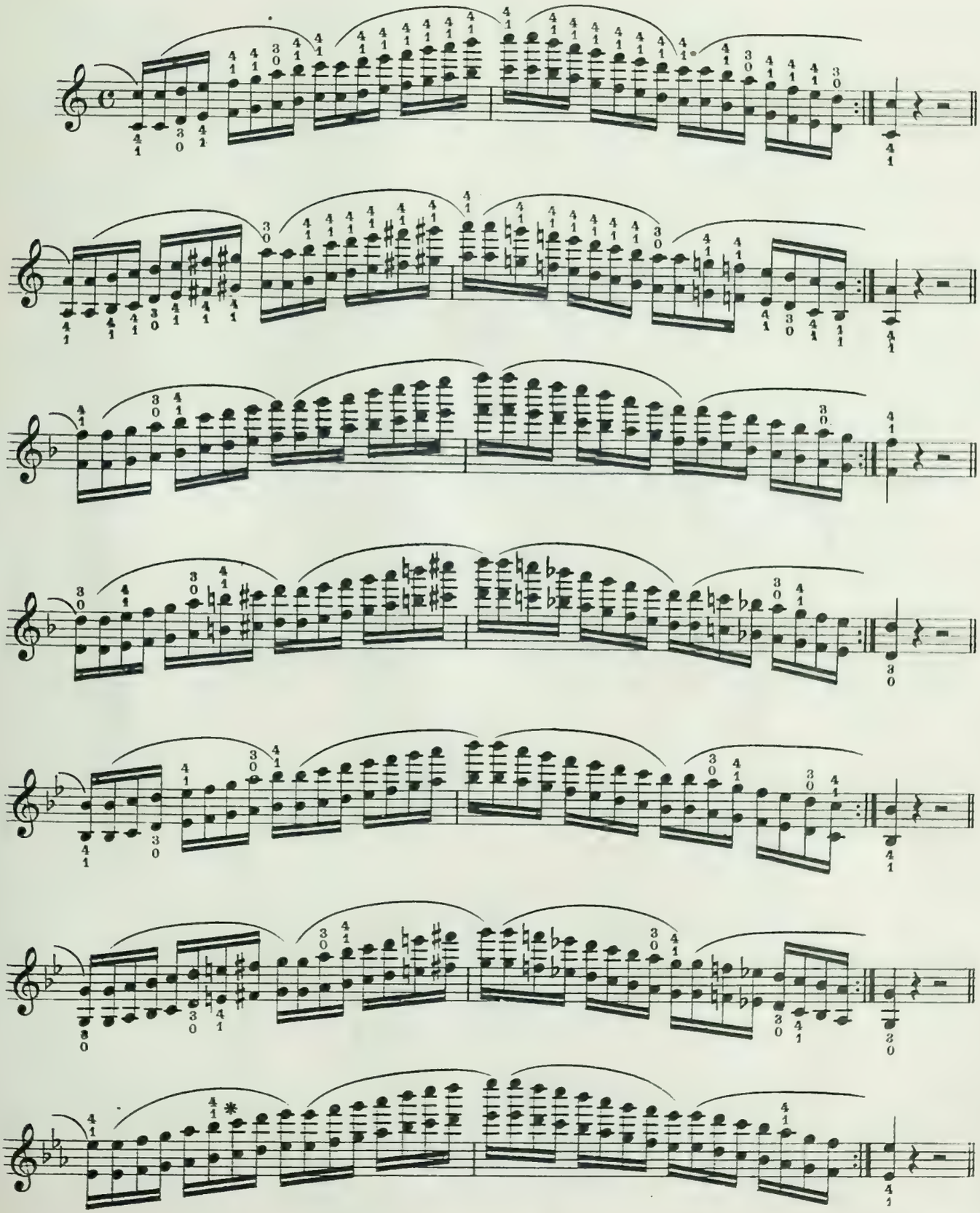
Sixths



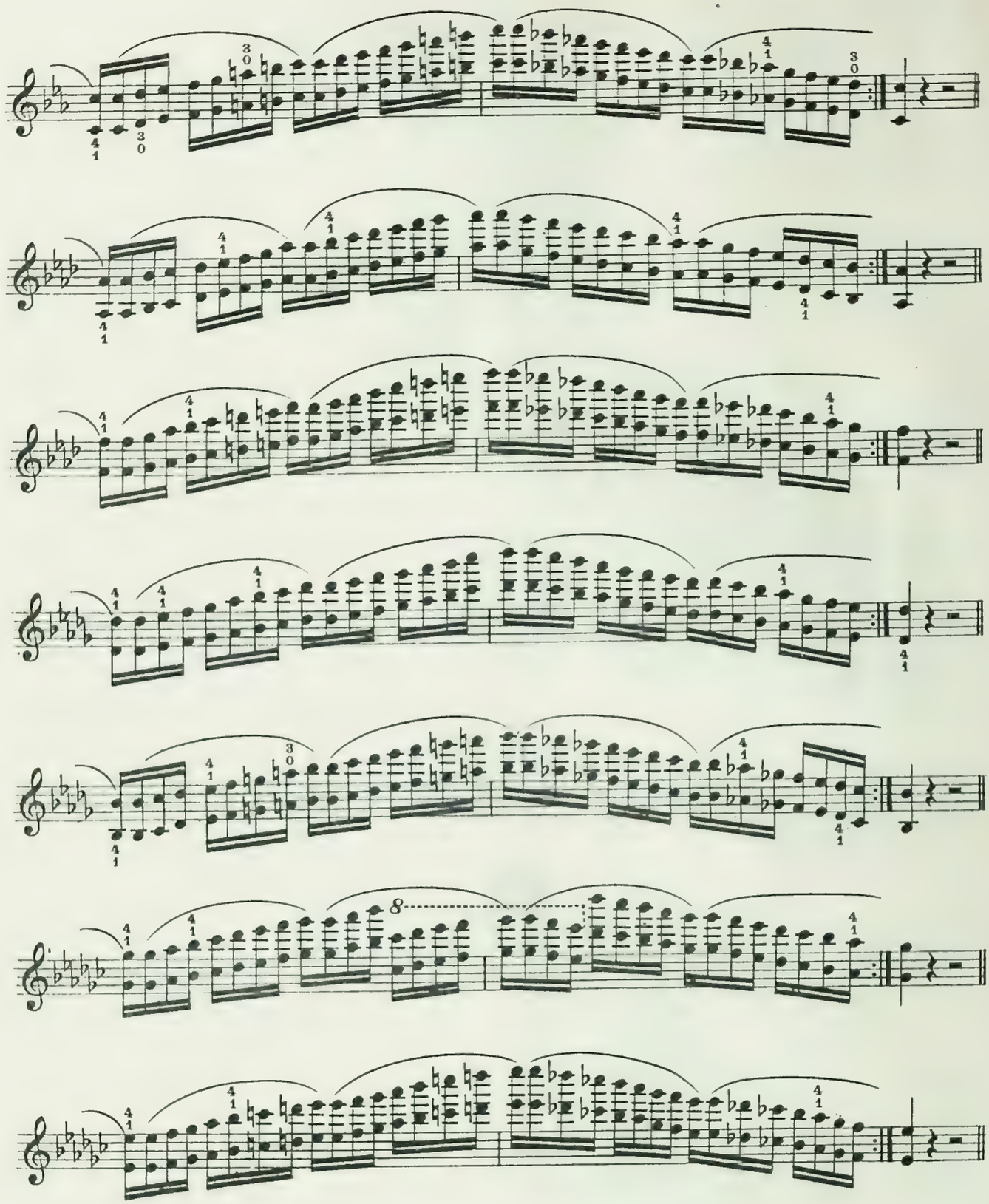


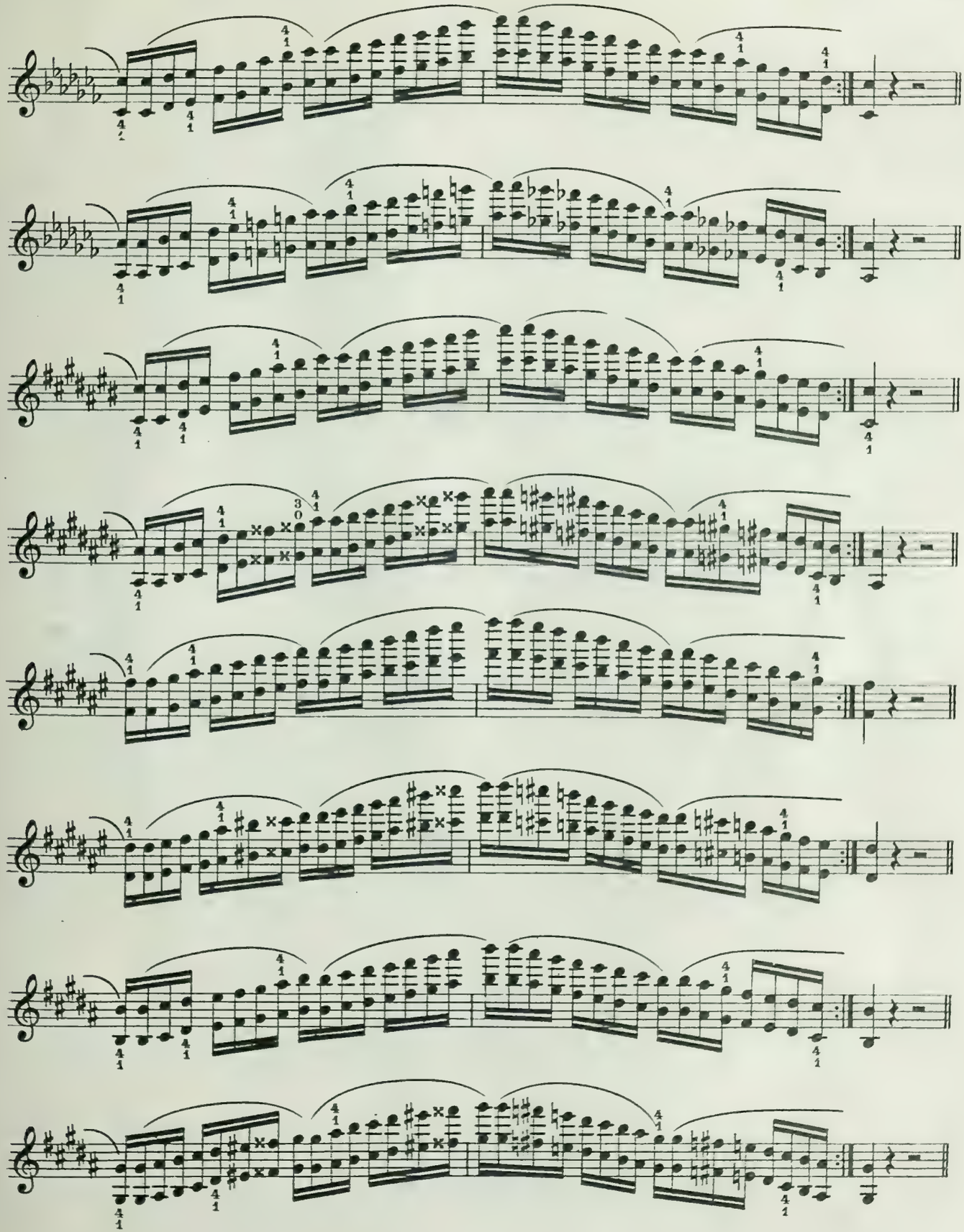


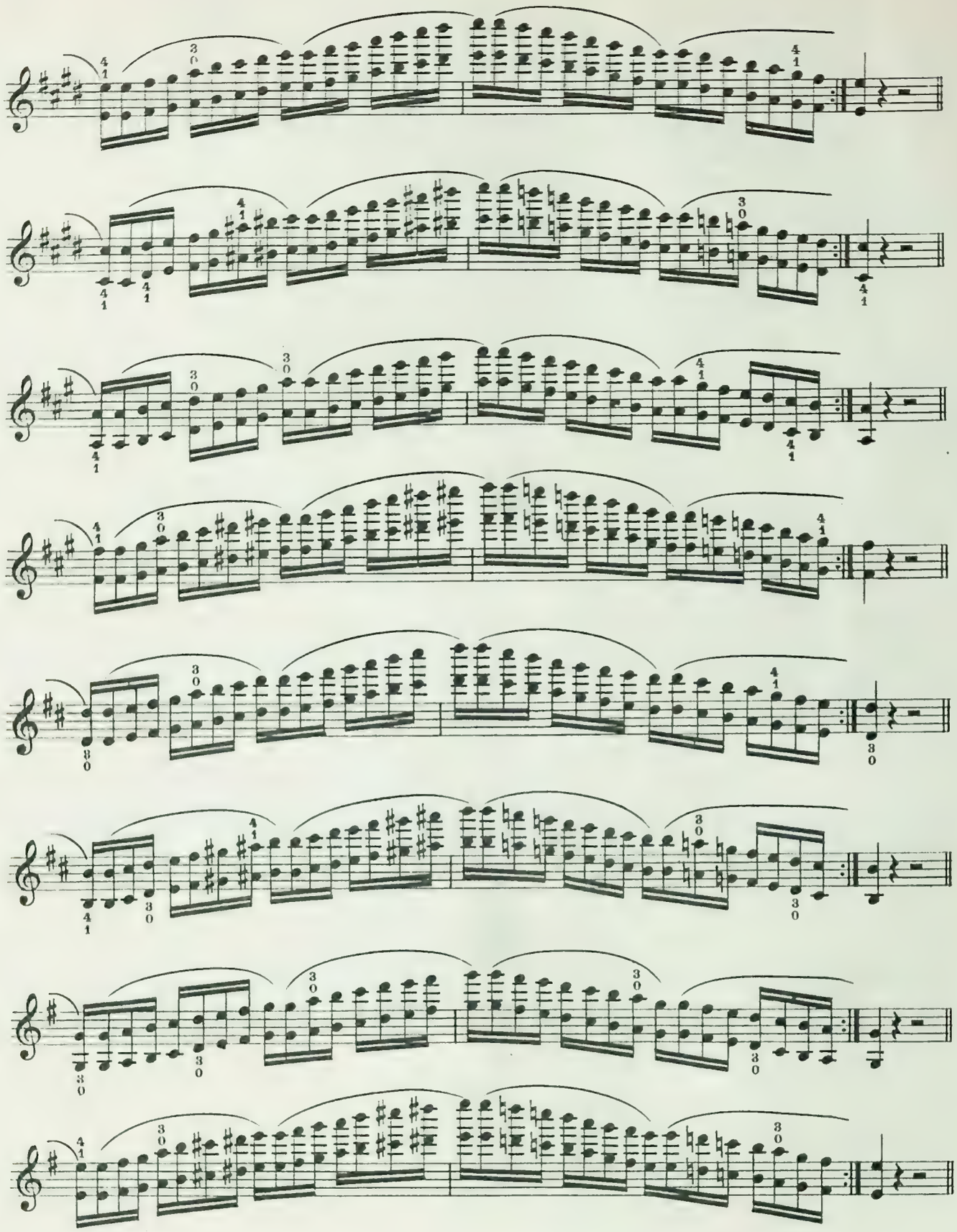
Octaves



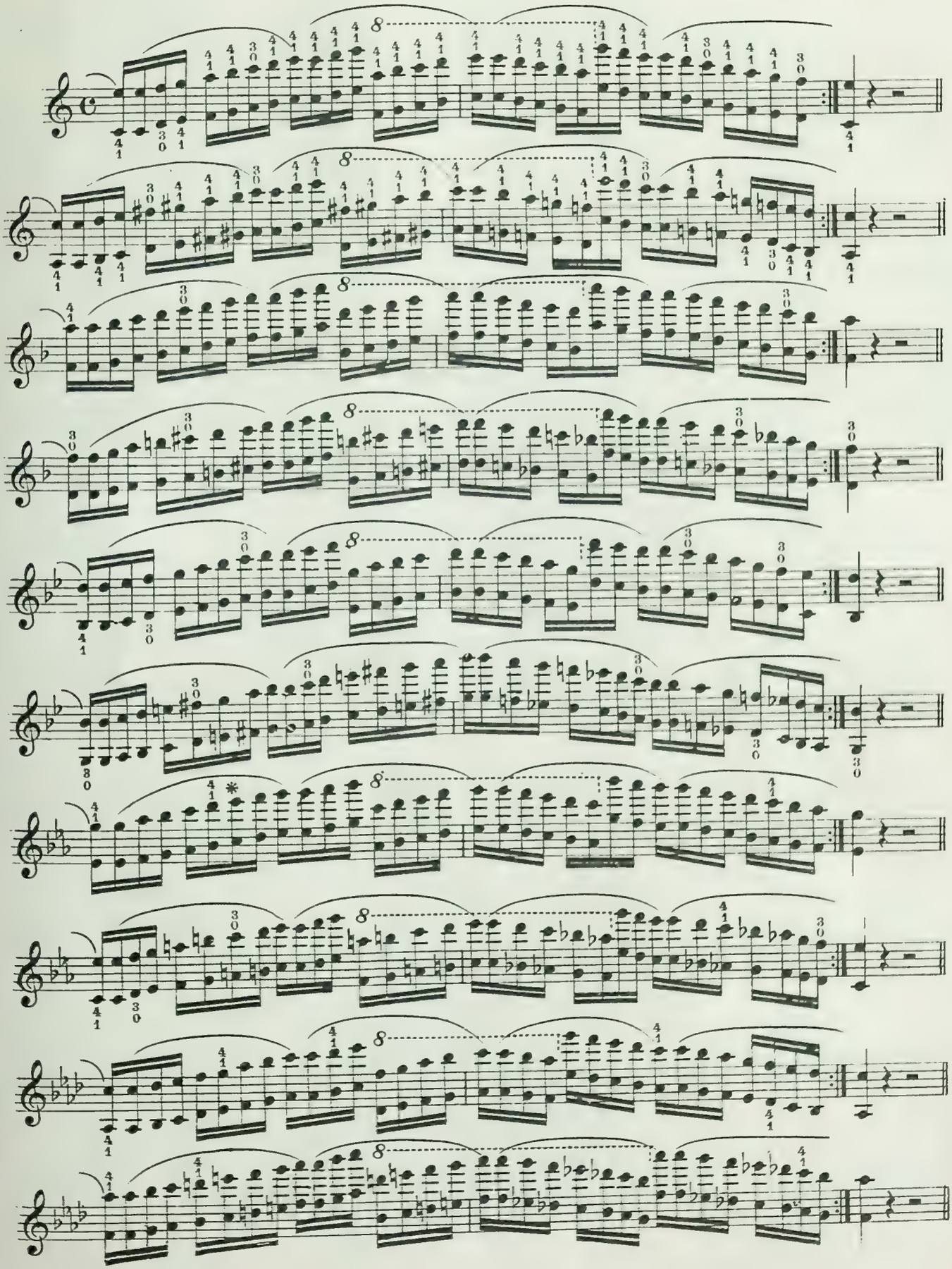
*Change of string



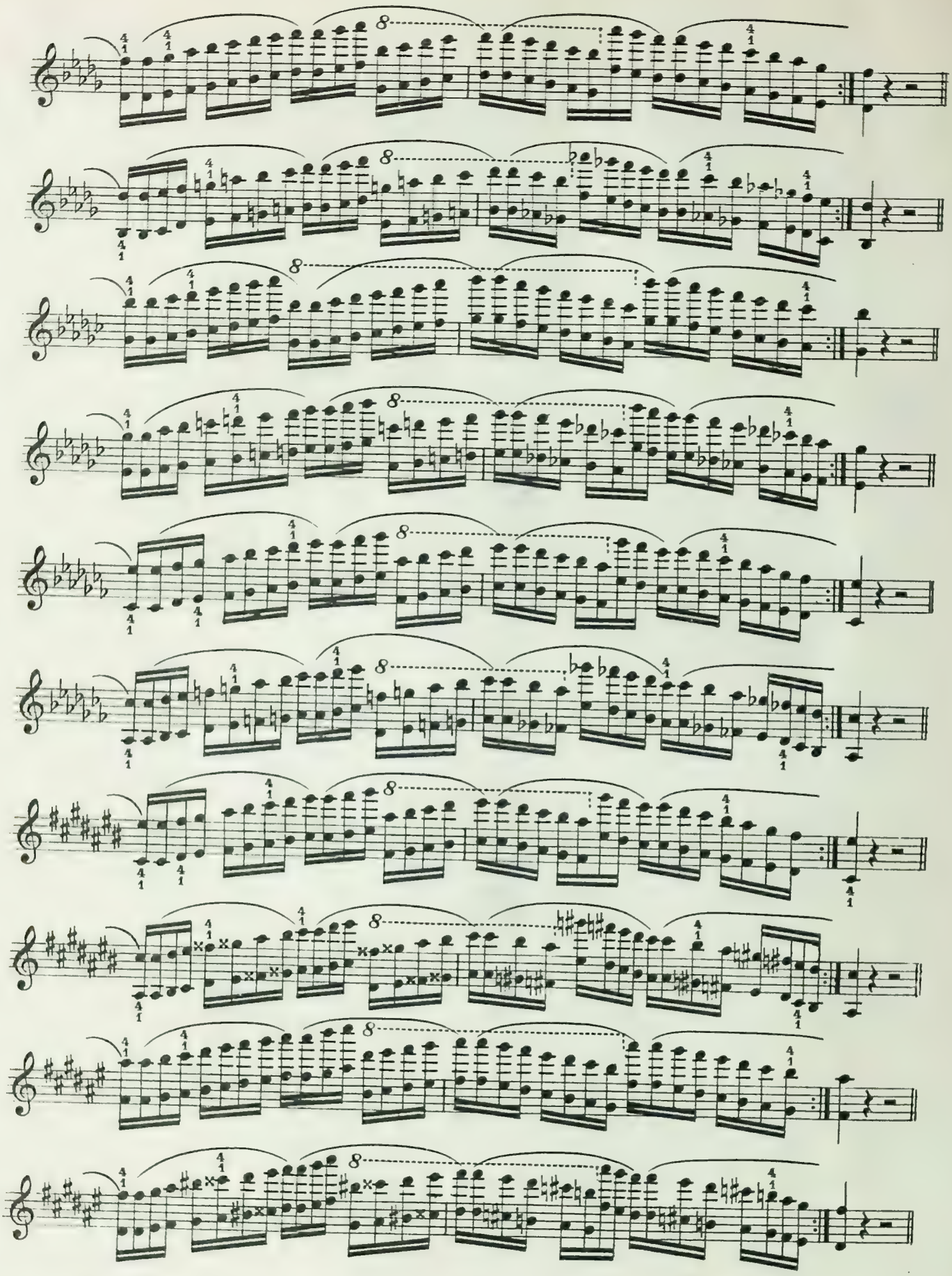


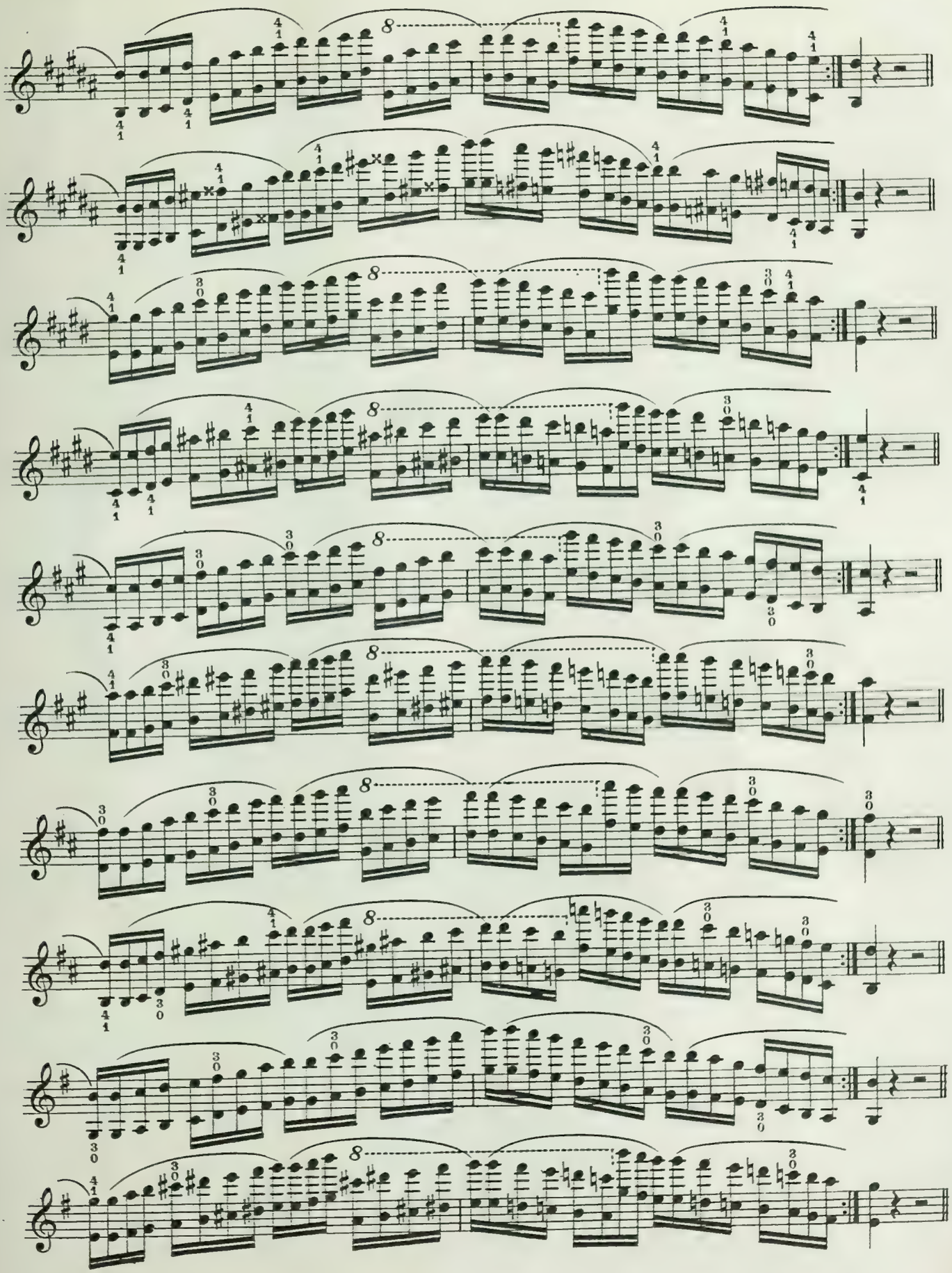


Tenths



*Change of string





PART IV

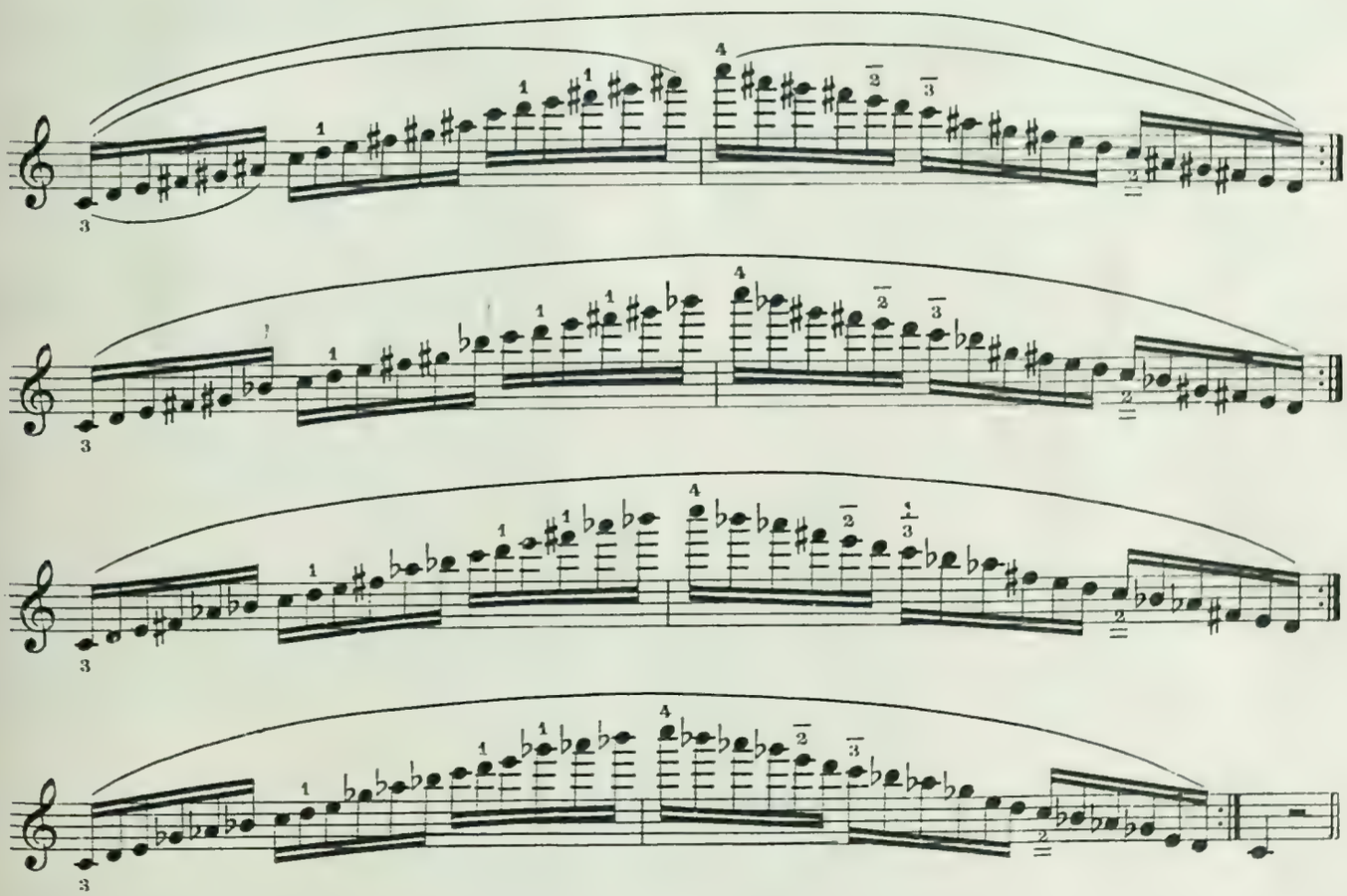
THE SCALES AND CHORD-STRUCTURES EMPLOYED IN MODERN COMPOSITION

PART IV

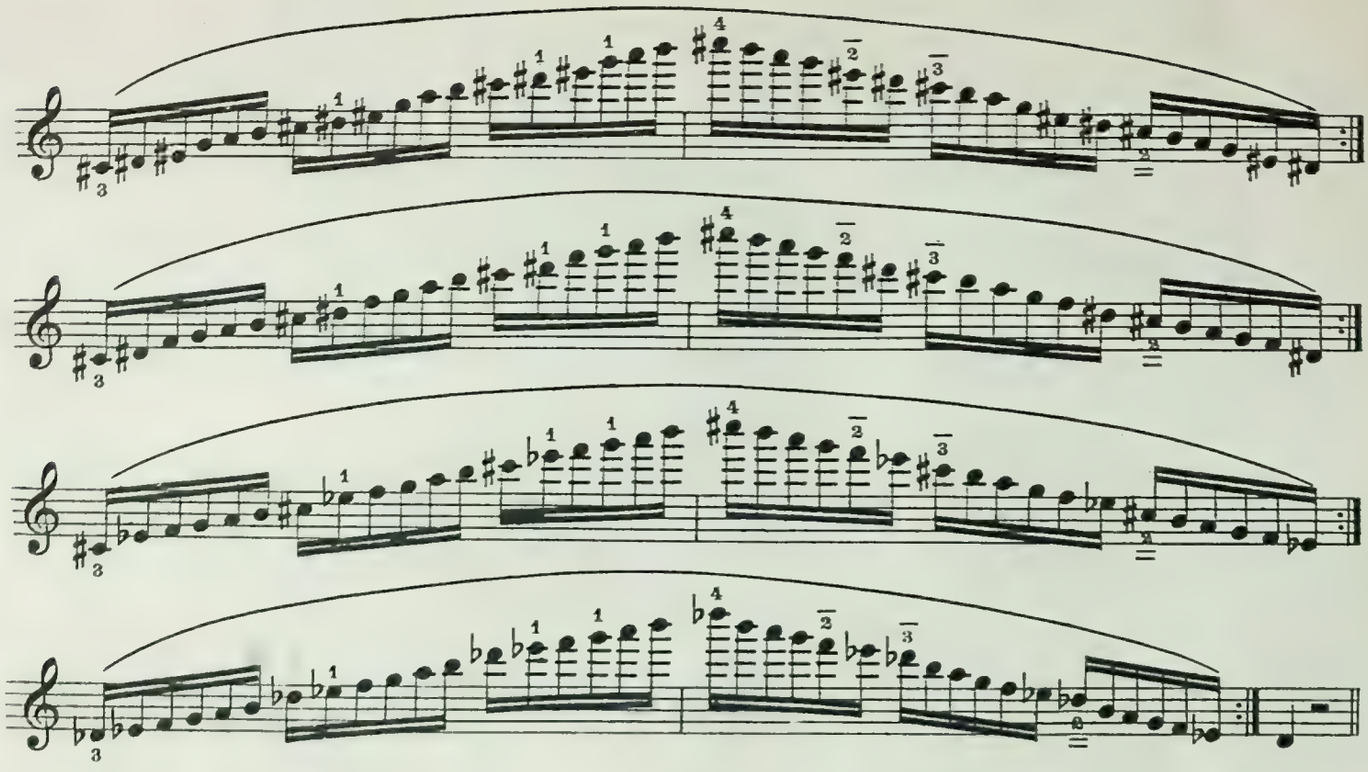
THE SCALES AND CHORD-STRUCTURES EMPLOYED IN MODERN COMPOSITION

The Whole-tone or Six-tone Scale

This scale is based on the acceptance of the equal temperament in tuning; it consists of six steps which divide the octave into six equal intervals; it does not possess a dominant or leading tone. There are actually but two whole-tone scales, taking C as one point of departure and C sharp or D flat as the other, all other points of departure and termination of either scale giving identical results, although the notation may vary to a great extent, with consequential variations in fingering. The only audible dif-difference will be that of pitch.



The above represent the four possible variations in notation of the six tone scale using C as depart ing tone; following is the one using C sharp or D flat.

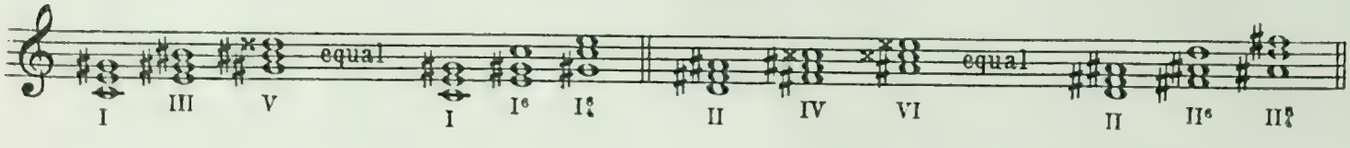


Only one fingering has been applied above, it is offered as a suggestive basis on which to work out individual requirments. On this principle play whole-tone scales departing from D, D sharp or E flat, F, etc., from the first, second, third and other positions.

Violinists being to a great extent accustomed to the pure temperament, the problems of intonation arising from the change to the equal temperament will be troublesome, but can be mastered in little time.

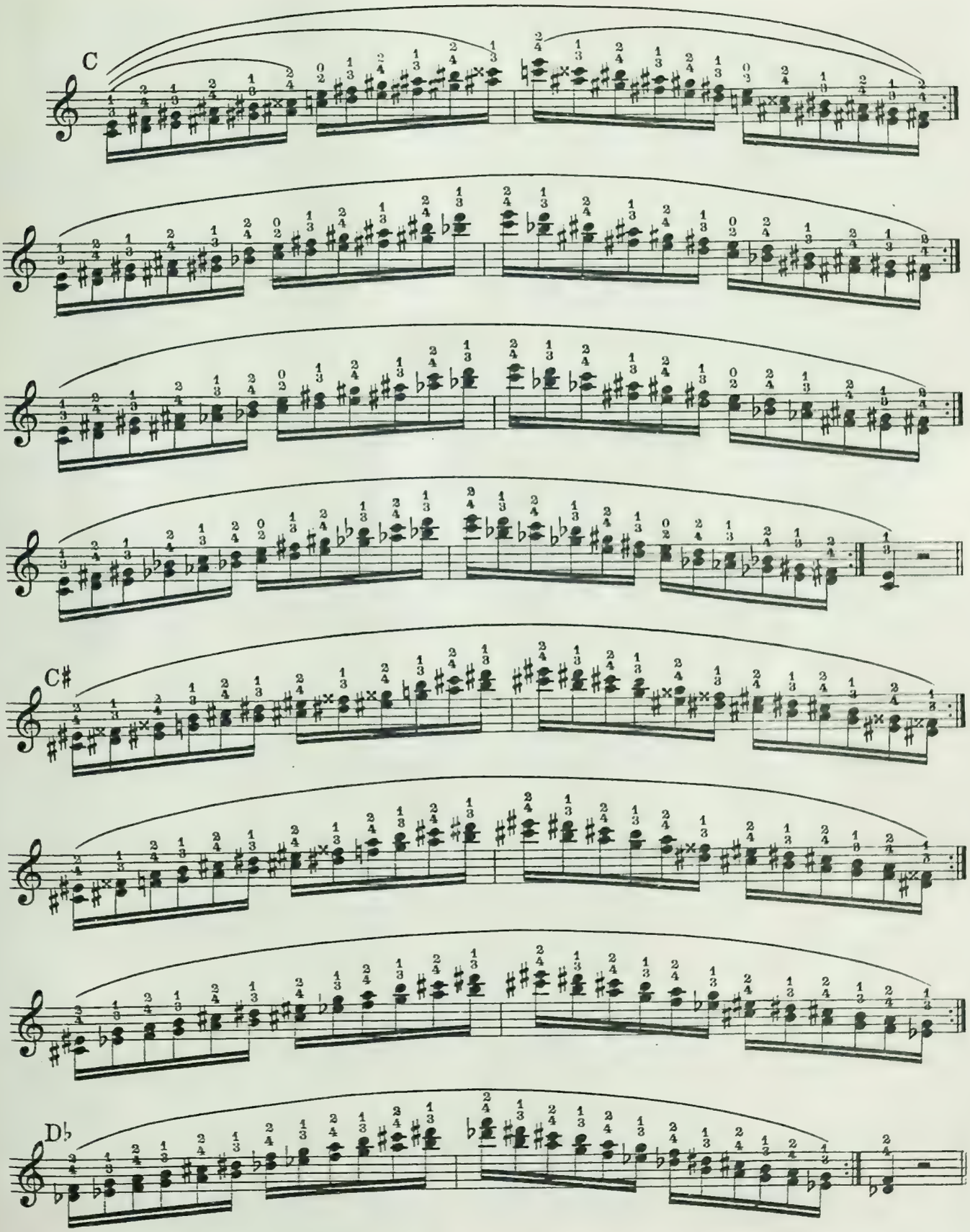
Chord-structures of the Whole-tone Scale

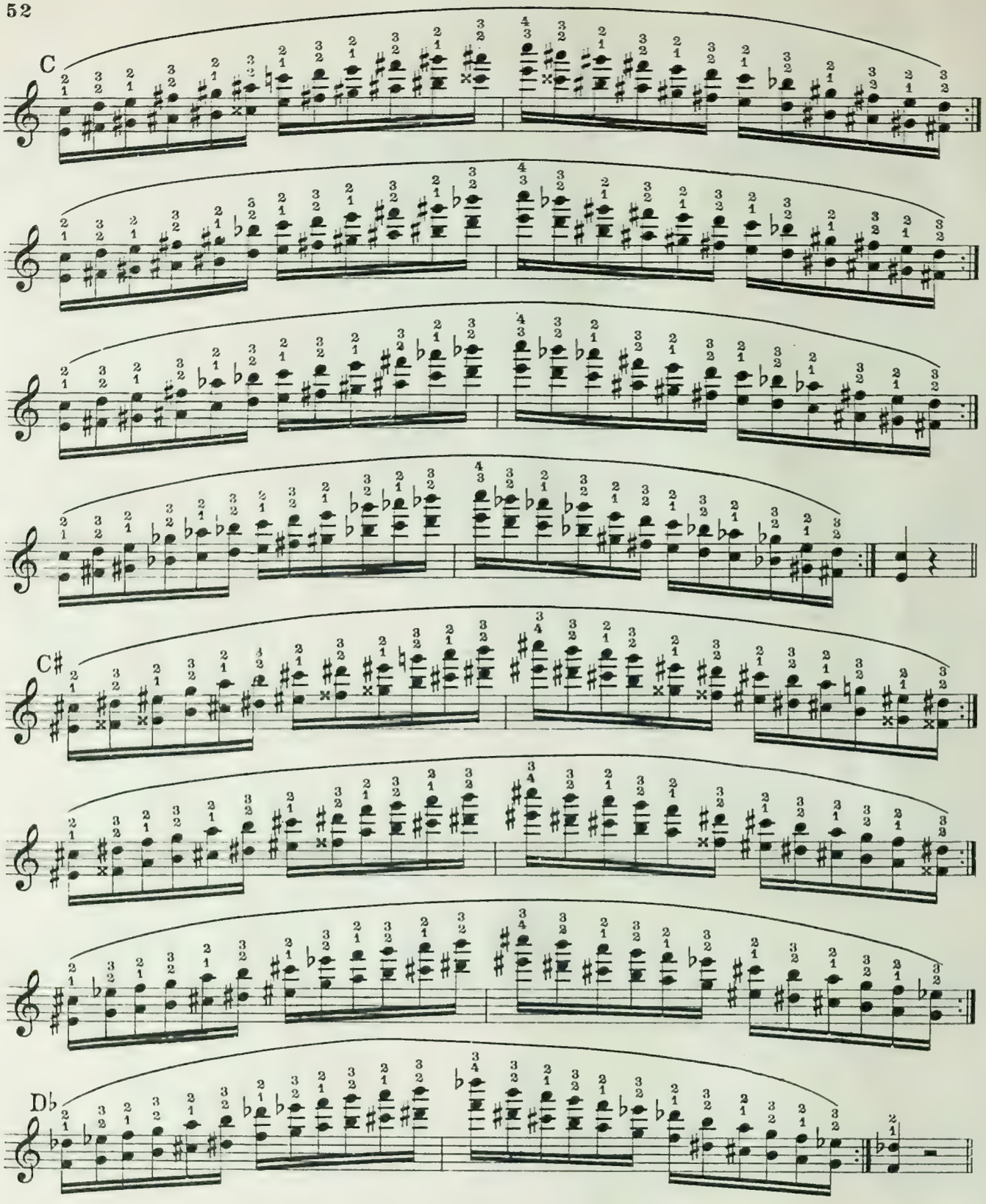
The intervals of this form of scale being all equal, the resulting chords are likewise so, resulting in a series of augmented triads of which each scale possesses actually but two, one on the first degree and one on the second degree; the triads on the third and fifth degrees being being but inversions of the triad on the first degree with enharmonically changed intervals, the triads on the fourth and sixth degrees inversions of that on the second degree.



The whole tone scale does not admit of construction of seventh or ninth chords. As augmented triads were included in the three-octave chord-studies presented in this work, it has not been deemed necessary to include them in this space.

The Whole-tone Scale in Thirds and Sixths





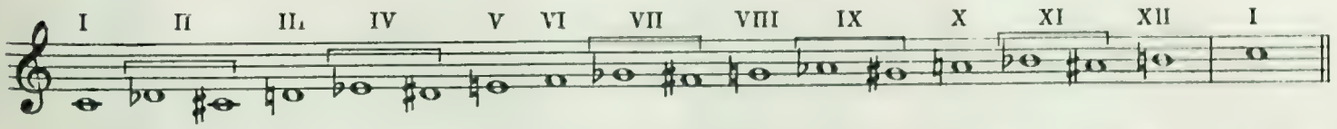
The practice of ignoring cross = or false = relation is becoming general with modern composers where it does not pertain to purely vocal composition. Play the whole-tone scales also in octaves and tenths; as well as in thirds, sixths, octaves and tenths departing from other tones and positions. Vary the combination of fingering.

The Half-tone or Twelve tone Scale

This scale is also based on the acceptance of the equal temperament. It consists of twelve steps which divide the octave into twelve equal intervals. Considered from the technical point of violin playing the fingering applied will be the same as that applied to the chromatic scale, but in the technic of composition this scale assumes a far greater importance, its influence in fact has been revolutionary.

The Chromatic scale is considered as a modification of the diatonic scale, the chromatic tones being only of secondary importance. In the twelve tone scale each *tone* is considered as of equal importance, thereby creating an entirely new harmonic principle: In the diatonic scale we could construct on each tone one triad, one seventh-chord, one ninth-chord, etc., (strictly speaking within the key) the twelve tone scale permits of the construction of four different triads on each tone, of nine different seventh-chords, of sixteen or more different ninth-chords, (theorists differ as to the number of species of ninth-chords to be recognized harmonically) not to mention the great number of chords of the eleventh, thirteenth, etc., it permits of the unlimited succession of equal intervals of any variety, of succession of chords of like species, of the partial or entire evasion of any fixed tonality, of the abandonment of dominant influence, and permits of the new technic of constructing chords of intervals other than thirds.

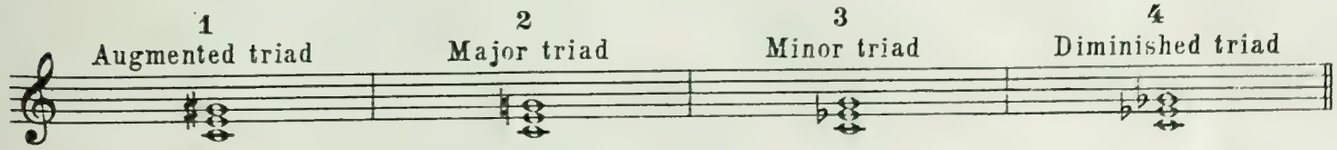
THE TWELVE TONE SCALE



The flats and sharps in each case represent one sound, the notation only varying. The results when using other points of departure and termination will always be the same, excepting the difference in pitch. Apply various fingerings given for the chromatic scale previously.

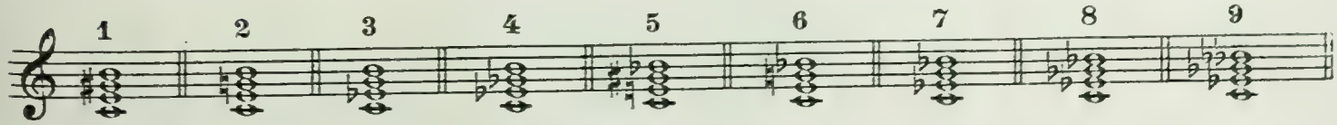
Some of the Chord-structures of the Twelve-tone Scale

TRIADS



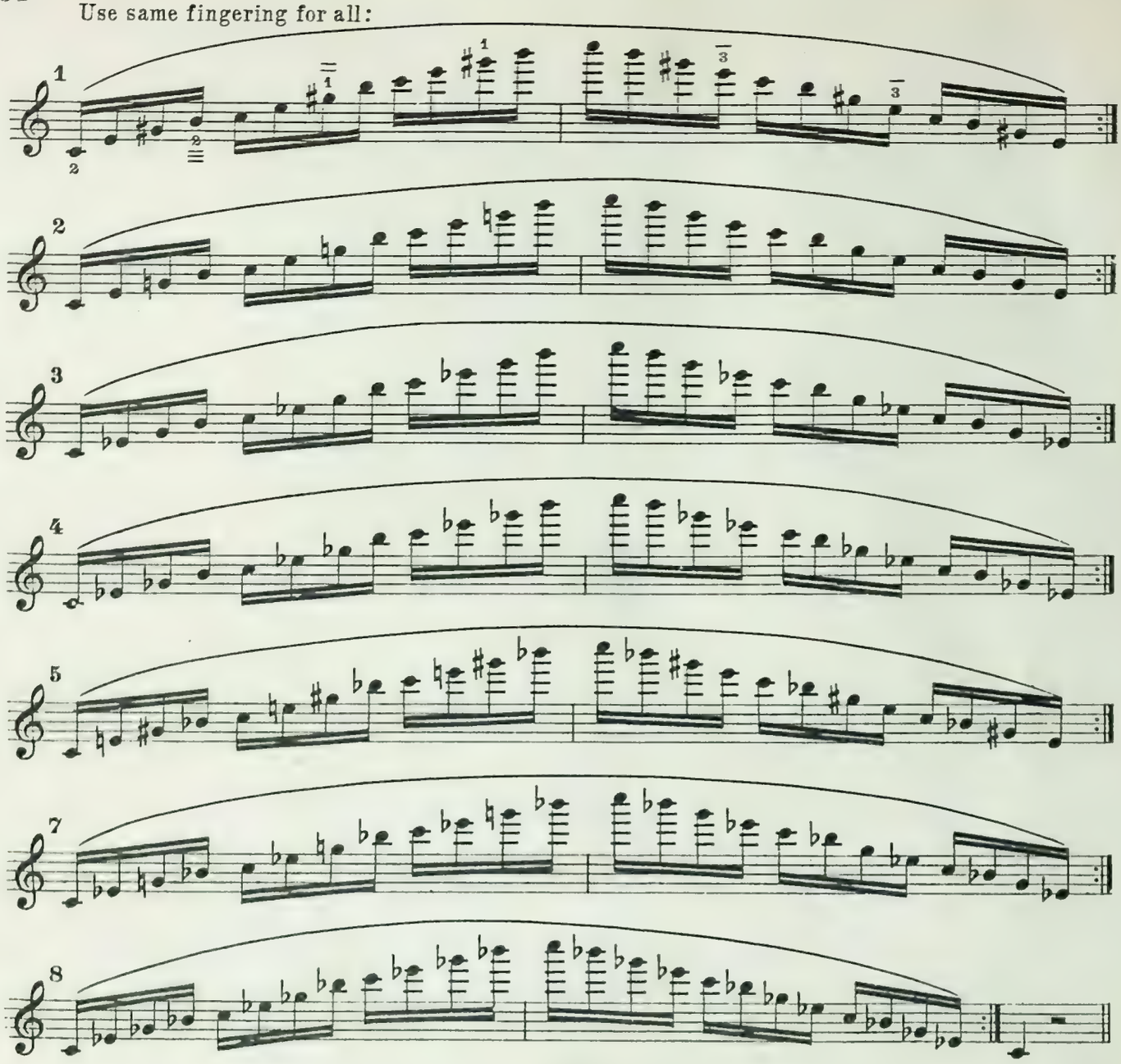
(All four were included previously in the three-octave chord-studies.)

SEVENTH-CHORDS

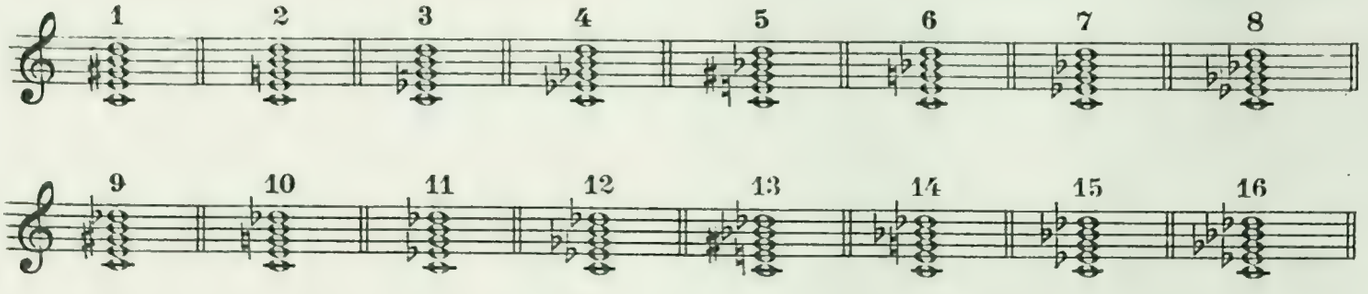


Four seventh-chords with a major seventh; four with a minor seventh; and one with a diminished seventh. Species six and nine were included previously in the three-octave chord-studies; the others are herewith illustrated for practical use.

Use same fingering for all:

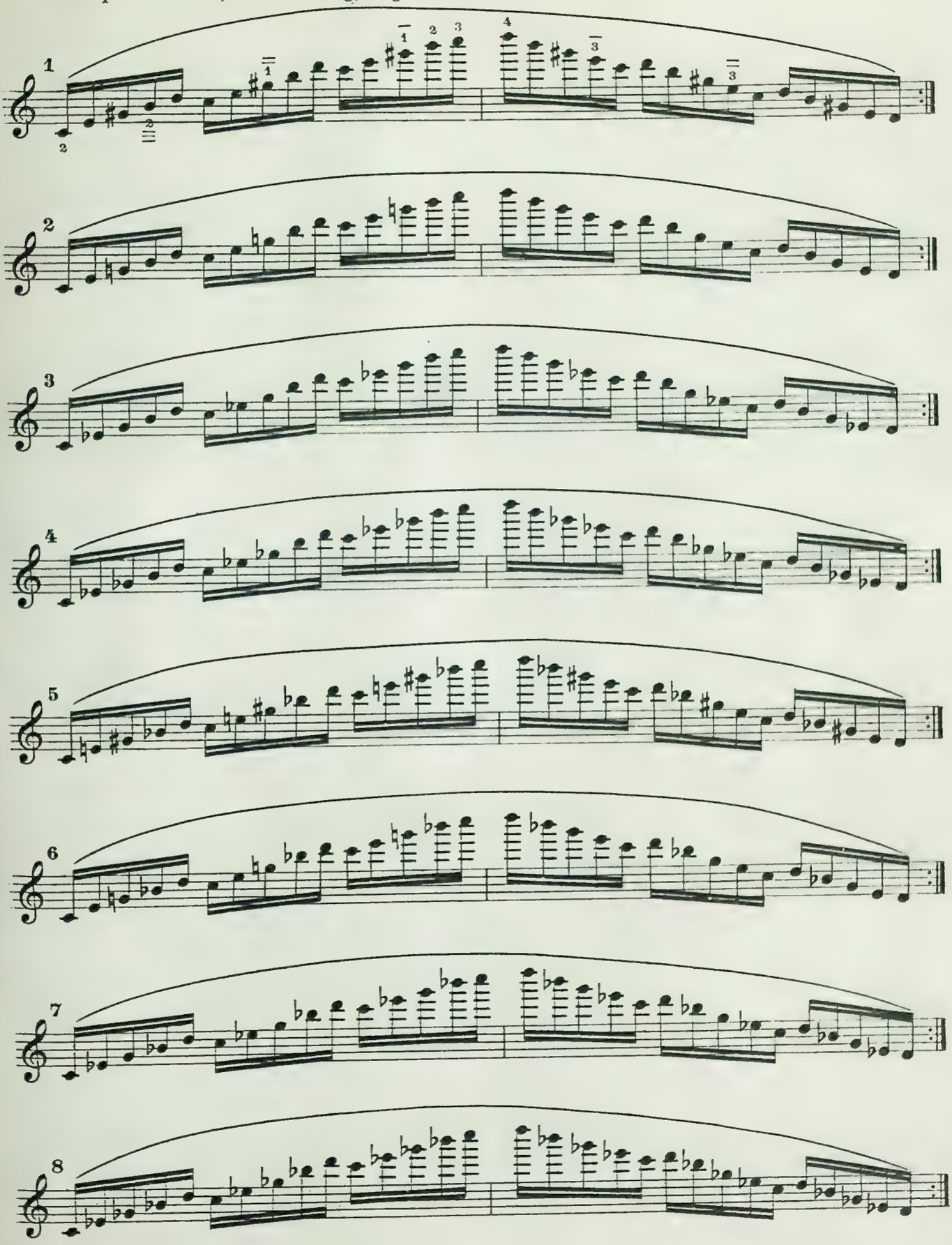


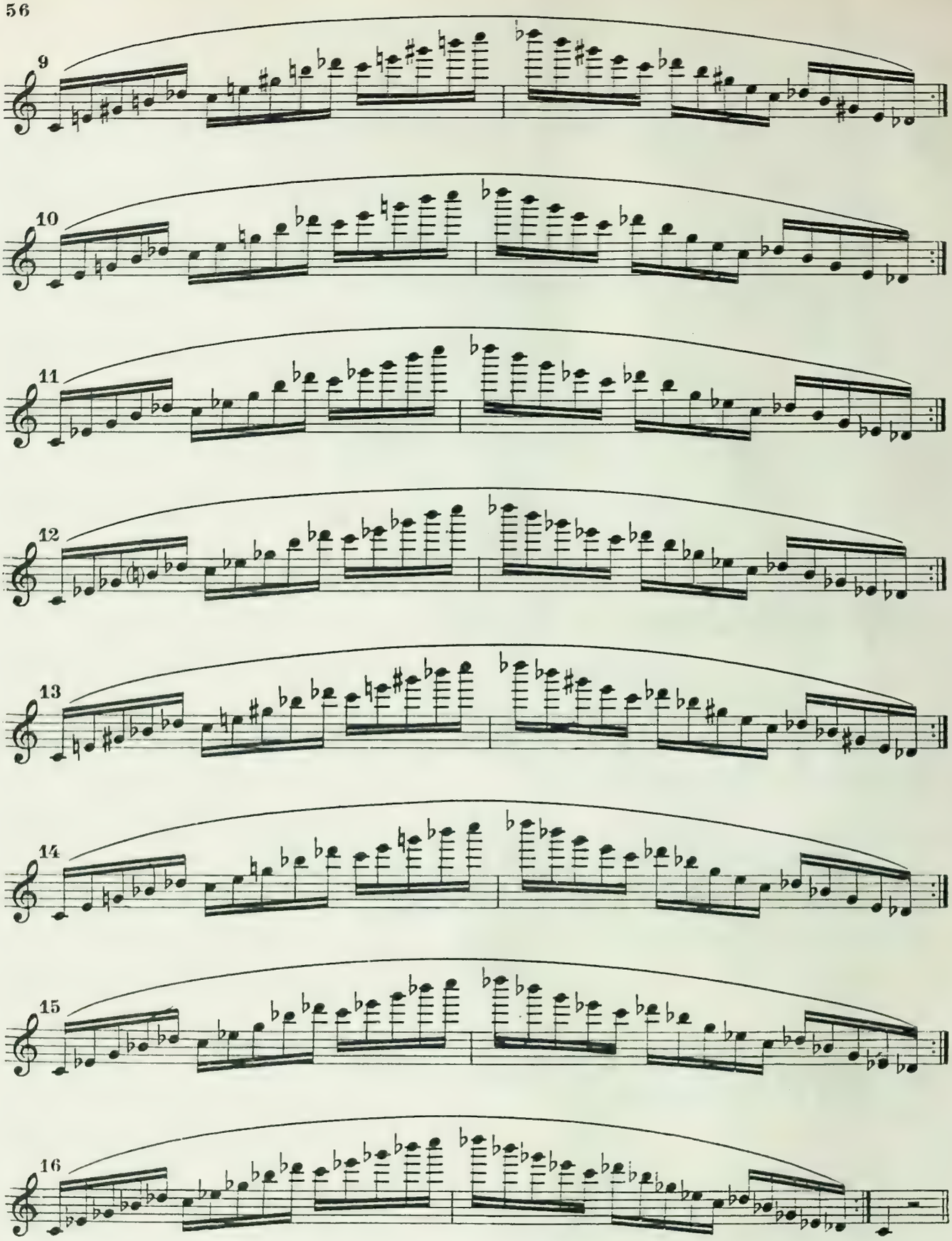
NINTH-CHORDS



Eight ninth-chords with a major ninth; and eight with a minor ninth. A few more species are possible by using augmented ninths.

For practical use, use same fingering for all:



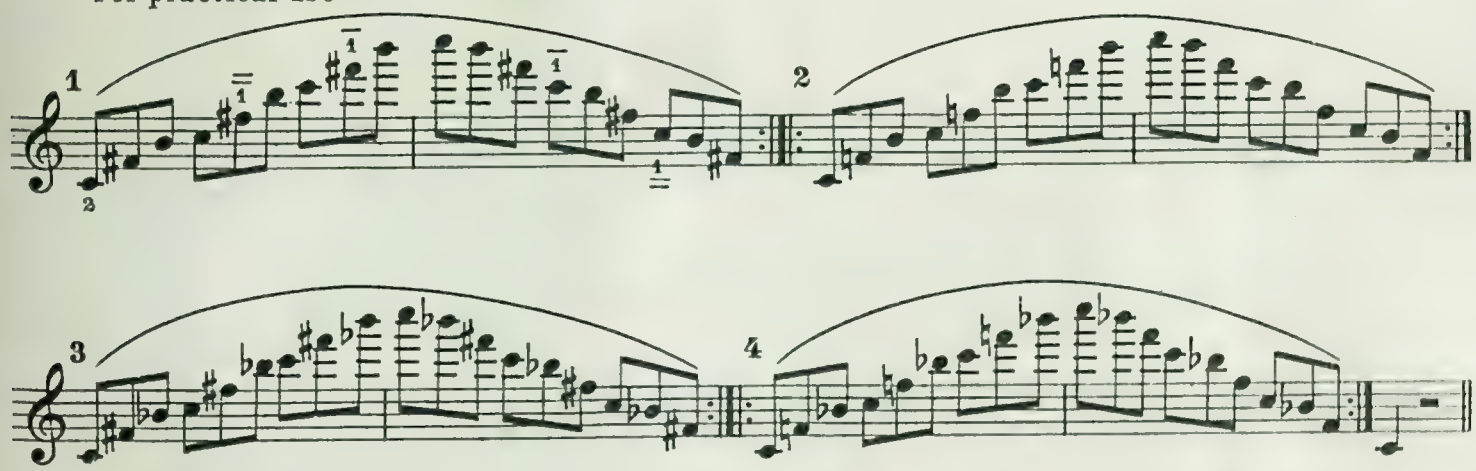

9
10
11
12
13
14
15
16

Chords constructed of Fourths

WITH THREE CONSTITUENTS

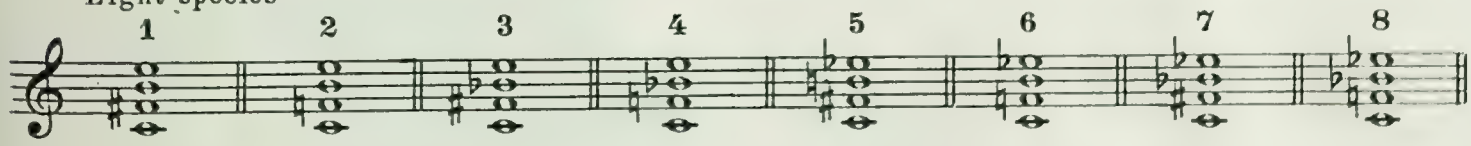
Four species

For practical use

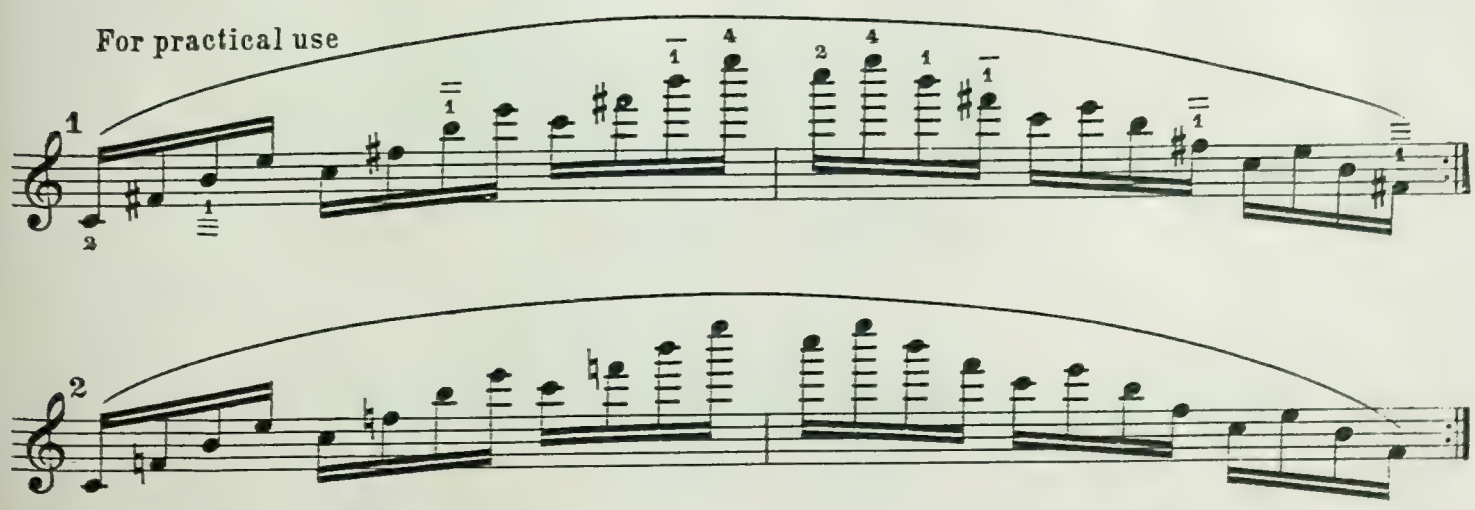


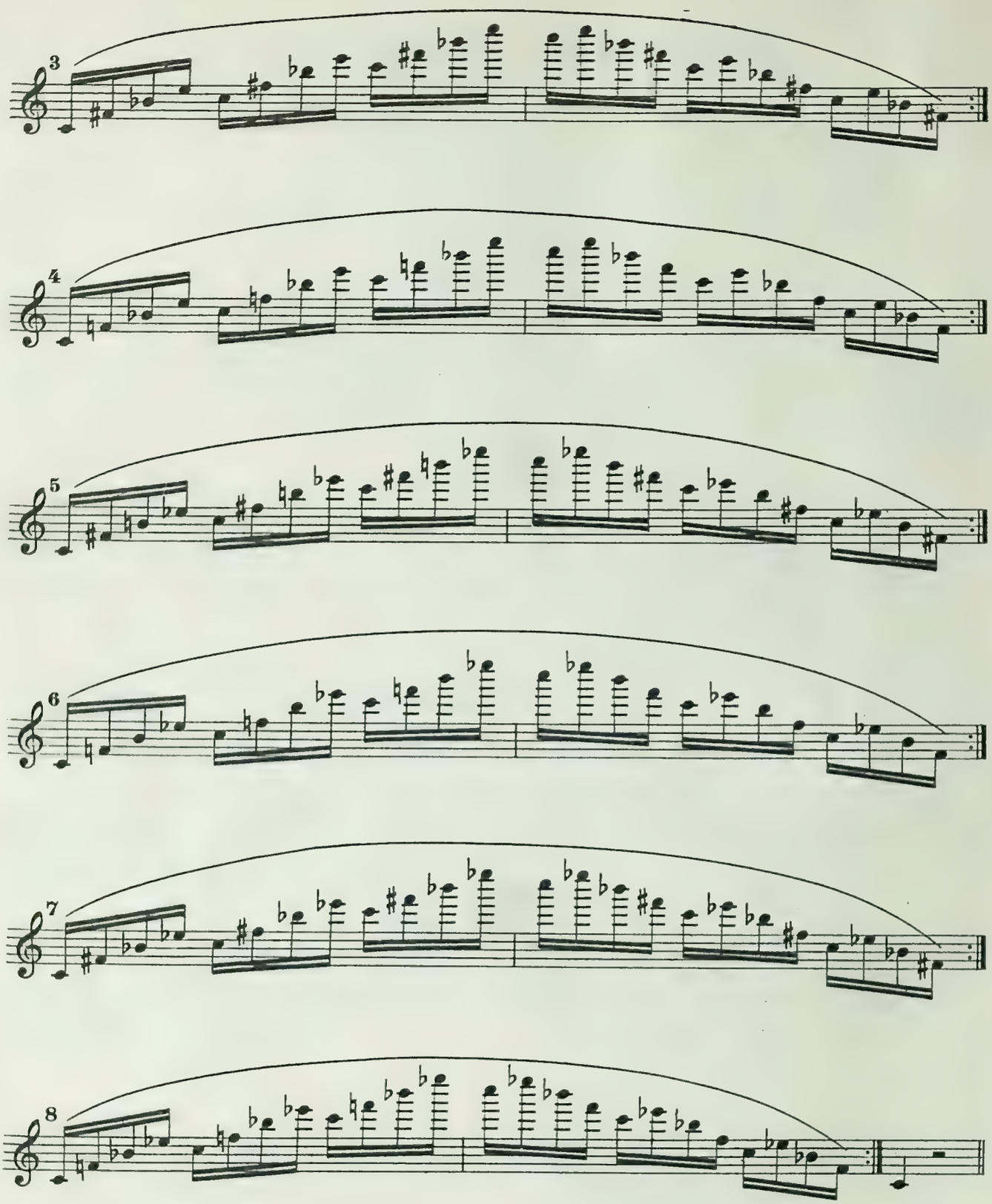
WITH FOUR CONSTITUENTS

Eight species



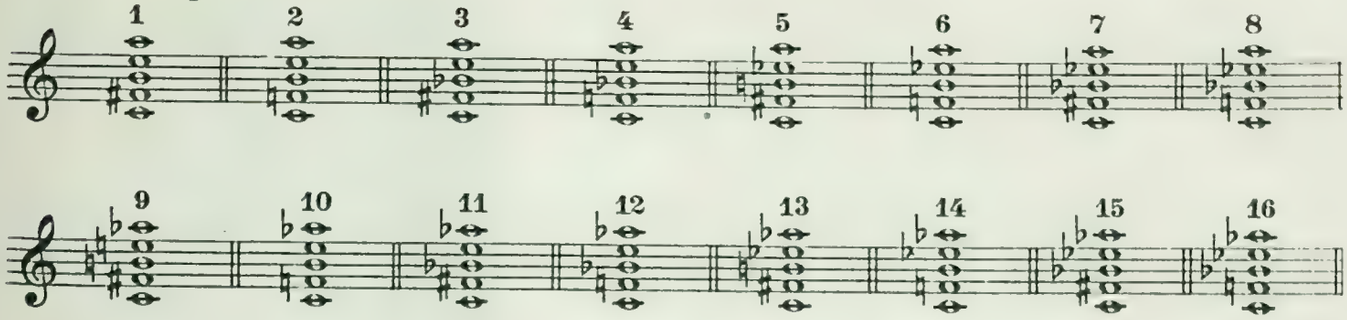
For practical use




3
4
5
6
7
8

WITH FIVE CONSTITUENTS

Sixteen species



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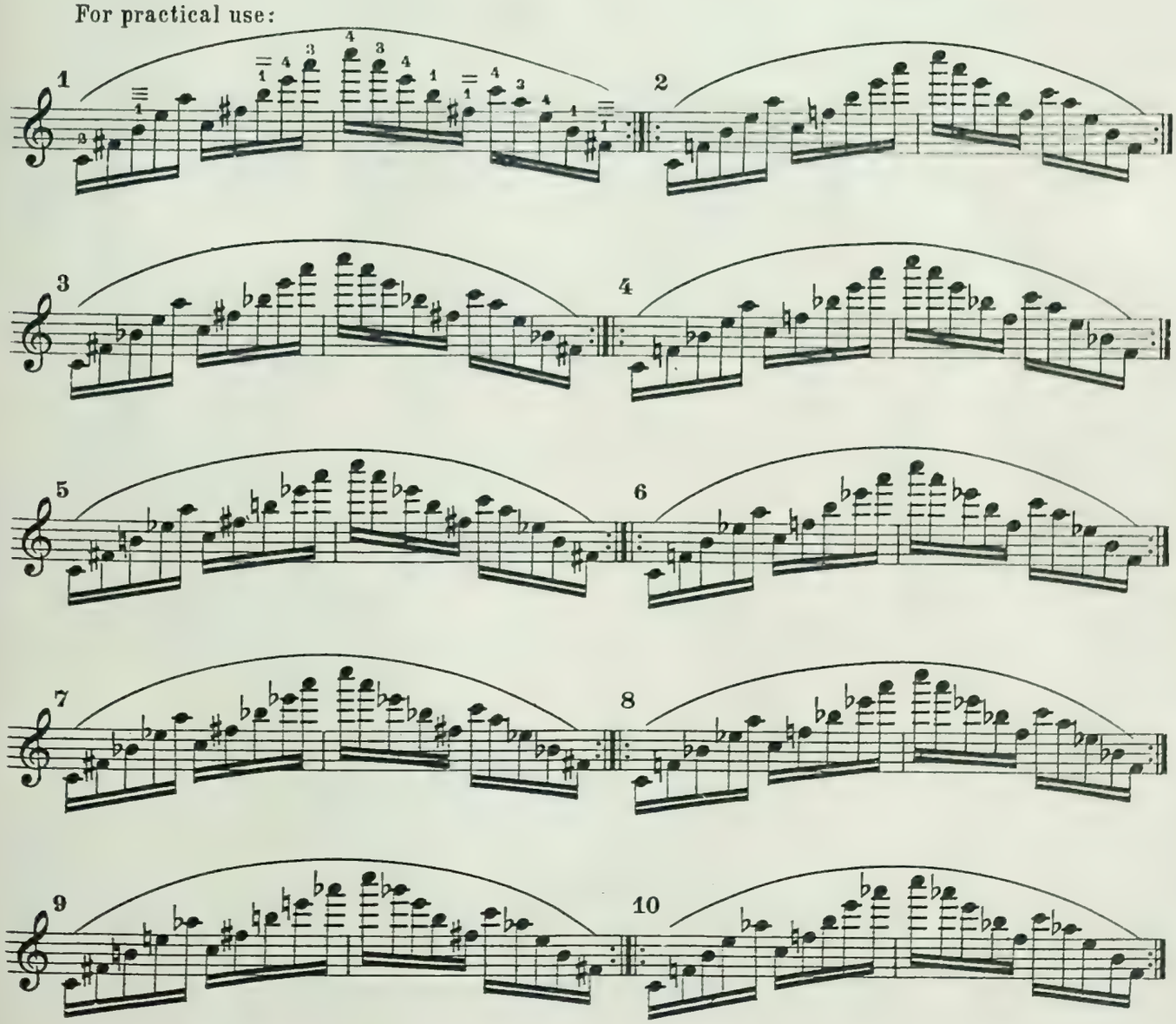
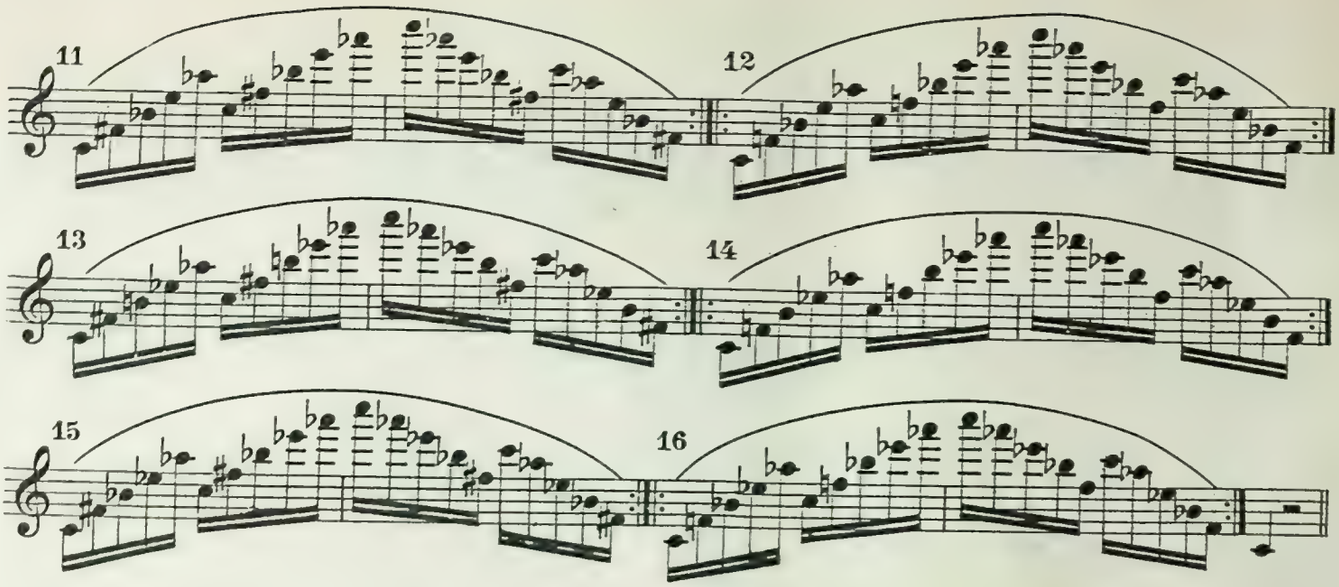




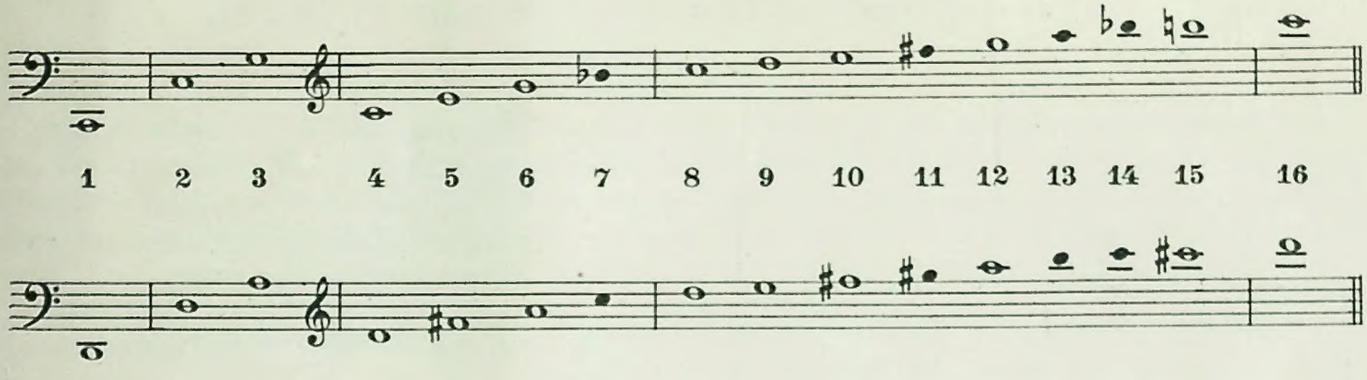
Construct and play all or the most of these chords on C sharp or D flat, D, etc.; apply various fingering. In their practical application in composition these chords cannot all be considered as being equally good. their use will depend more or less upon their relation to the preceeding combination and to the next following one, as well as to the particular effect desired. As given principal consideration here they represent but a few of the many possibilities of chord-structure of the twelve-tone scale reduced to practical study purposes for the violin. All chords have been considered from their fundamental position only, (constructed upwards from the root) the combinations possible through inversions and changes of position of the chords being readily apparent after acquaintance with the original structure.

Various Other Scales

Of the various other forms of scales employed in modern composition we find but few which prove quite so interesting violinistically as the six tone and twelve tone scales, as a matter of musicianship however it is advisable to be acquainted with the nature of their construction.

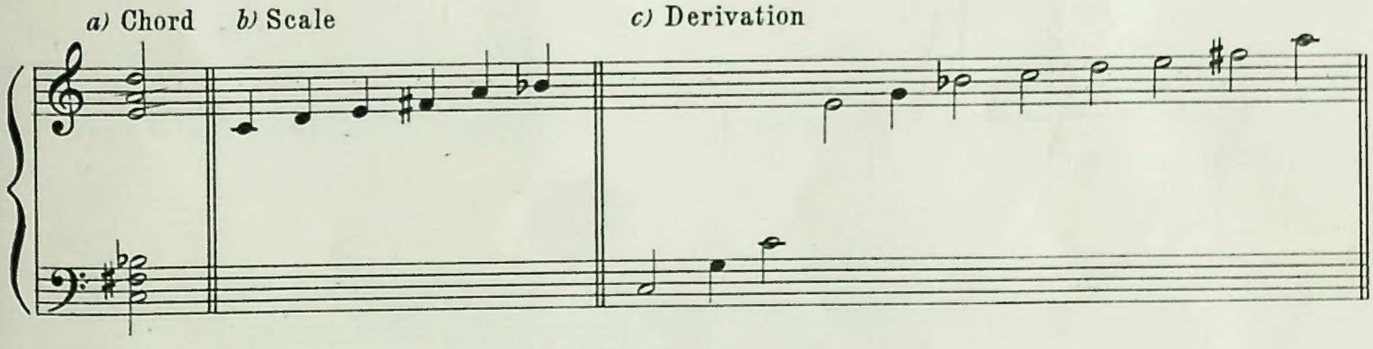
The Natural Harmonic Series

This scale demands acceptance of the unequal or pure temperament in tuning, it is based on the overtones (upper partial tones) given off by a vibrating body such as a string, metal, wood, membrane or a column of air. The volume and quality of these overtones depend upon the amplitude of vibration, the elasticity of the vibrating body and the form which these vibrations assume. All musical sounds which conform to periodic vibration give the same series of overtones. [Helmholtz, "The Sensation of Tone" Chap. I]



The first overtone is the octave, with twice the number of vibrations of the ground tone.
The second overtone is the fifth of the octave, with three times the number of vibrations of the ground tone.
The third overtone is the double-octave, with four times the number of vibrations of the ground tone, etc.

Some of these tones, numbers eleven, thirteen, fourteen and fifteen especially, were considered to be too much out of tune with our system to be useful; Scriabin, who made extensive use of this series considered them near enough to be of use and he selets a chord of six constituents from it, from which in in turn he derives a scale.

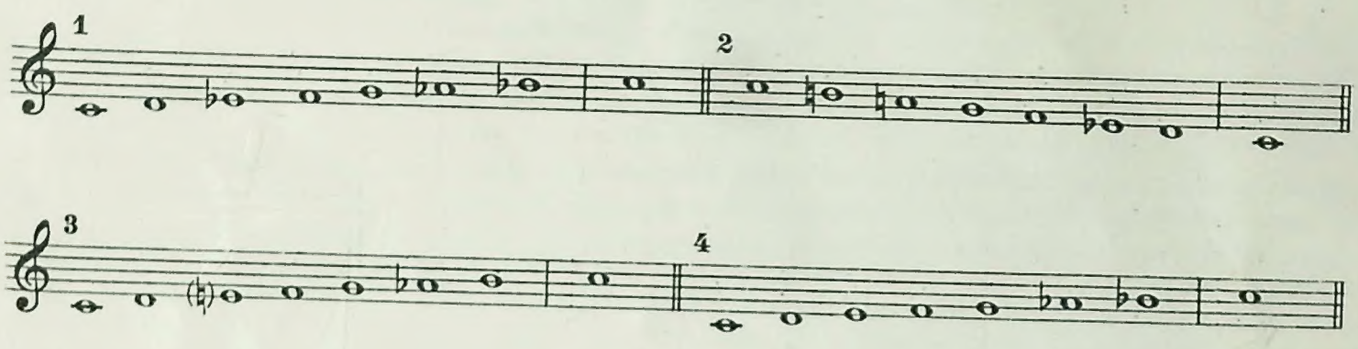


A. Eaglefield Hull, in his "Modern Harmony" [by courtesy of The Boston Music Co. Publishers] whose illustration is here reproduced, in his reference to Scriabin and the forgoing example (p.72) states: "it is more than a favourite chord, it is in a way his only chord, from which he derives his scale and the whole of the material for his great tone-poem "Prometheus." He selects this chord from the natural harmonic series, and so evolves a scale which is only redeemed from coincidence with the "tonal" (six tone) one by the leap of a minor third instead of a tone. This leap however makes all the difference, for whereas the "tonal" scale never changes its "colour-sensation" in its inversions, and only allows of one transposition, (a semitone up or down) Scriabin's is ever scintilating with new lights quite kaleidoscopic in colour, and it allows the full range of twelve transpositions."

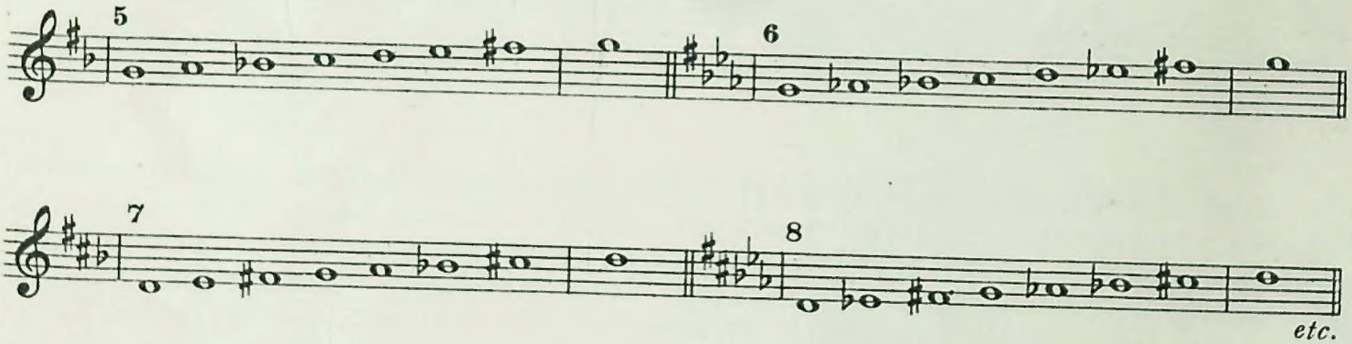
Alterations of the Seven-tone System

"Numberless modifications of the major and minor scales will be found in the works of both the older as well as the modern composers, and they may be used as fundamental alterations of the scale and adopted throughout, or only momentarily, for lighting up or shading certain chords or passages. "—— " The present position is that a composer is free to adopt any arrangement of the seven divisions of the octave which will serve best for the purposes of his expression." A. Eaglefield Hull, "Modern Harmony" Chap. VI [by courtesy of The Boston Music Co., Publishers.]

To this principle we can fully ascribe the constant growing use of alterations of the various degees of the major and minor scales. Following are a few examples:



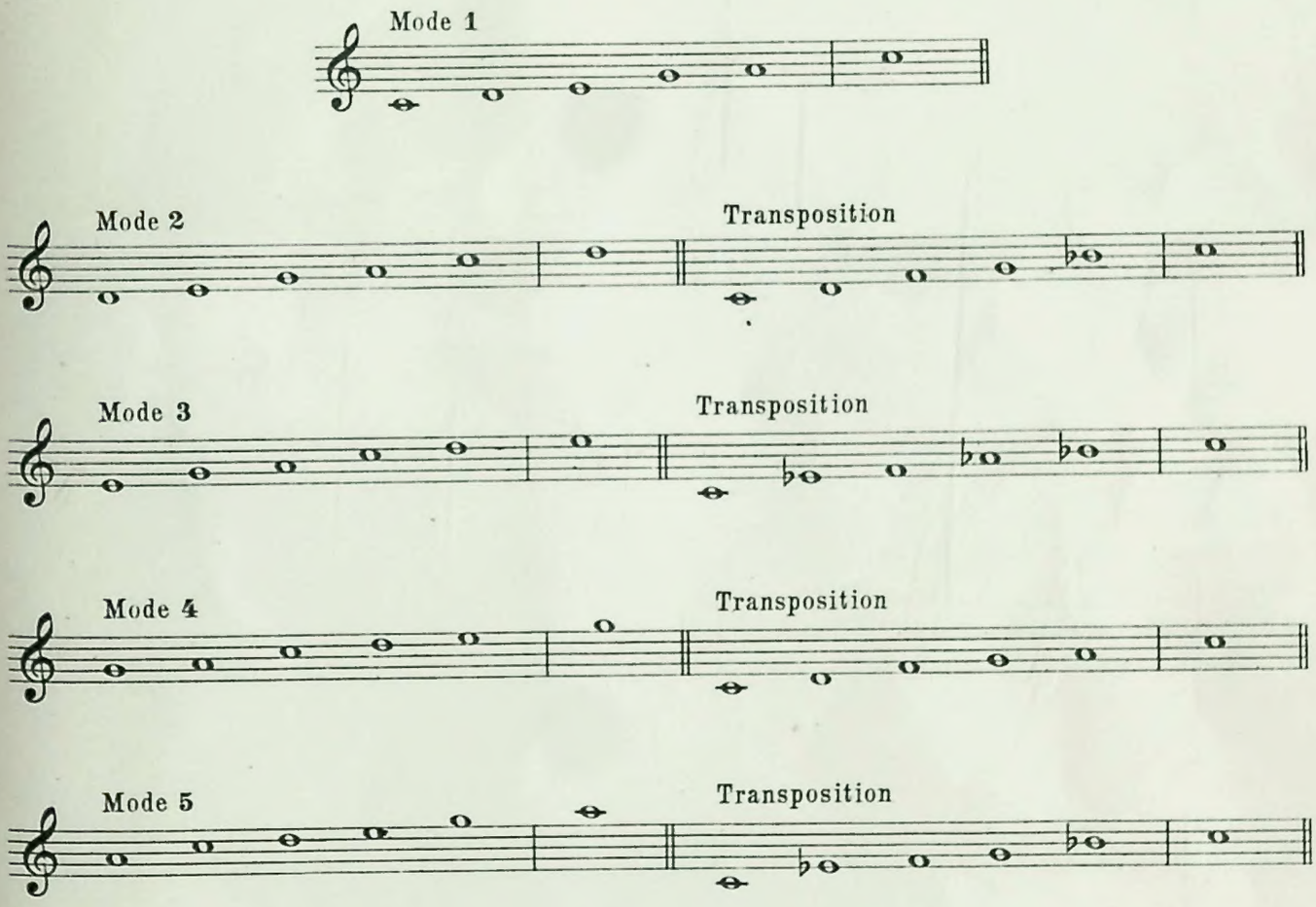
1 is the descending form of melodic minor used for ascent.
2 is the ascendinding form of melodic minor used for descent.
3 is the major scale with a minor sixth.
4 is the major scale with a minor sixth and minor seventh.
Nos. 5 to 8 following are suggestions offered by A. Eaglefield Hull for the formulation of further scales of this variety.



from A. Eaglefield Hull, "Modern Harmony" Chap. VI [courtesy of The Boston Music Co. Publishers.]

The Pentatonic Scale

A scale consisting of five steps to the octave, somewhat similar to our major scale with the fourth and seventh omitted. It is claimed of this scale that it is older even than that of the Greeks; it is still to be found in use today with some races. Following a pentatonic scale, four different modes of the same and their transpositions to C.



Wagner has based some of his themes on the Pentatonic Scale.

Scales of various forms consisting of intervals smaller than half-tones have not been taken into consideration in this work, they would prove of interest only to the theorist, and are not of practical use to us at the present.

What the Artists Say

PROF. LEOPOLD AUER:

Scales and Chord Studies for Violin, a compilation by William F. Happich, contain valuable theoretical and historical indications regarding the music of the ancients. * * * A wealth of material for the study of the chromatic scales will be found in the Scale and Chord Studies by William F. Happich, recommended above. The same book contains also arpeggio exercises in all the major and minor keys, the use of which I earnestly advise as a means of extending and fortifying the student's technique. Nor should the young violinist forget to practice the arpeggio on the chord of the seventh, and that on the chord of the ninth in the same volume, since both are excellent for perfecting intoration. (Violin Playing As I Teach It. F. A. Stokes & Co, N. Y.)

JASCHA HEIFETZ:

I am glad to say that your book "Scale and Chord Studies for Violin," is a fine contribution to the pedagogical literature of music. The work is logically arranged and contains interesting and instructive innovations. The book will prove of particular value to advanced students. I am sure it will meet with deserving success.

EFREM ZIMBALIST:

I have looked over your "Scale and Chord Studies for Violin," and find them excellent. They should be of great value to students, and I take pleasure in recommending them.

TOSCHA SEIDEL:

I have looked over your "Scale and Chord Studies" with great pleasure, and recognize the fact that you have created a great work for violinists. I am sure that it will be a great help for all violin students.

PAUL STOEVING:

The present volume contains some new features which will prove both interesting and instructive to the earnest student. The able introduction by Mr. Happich deserves high praise, and no small credit is due to the publishers for bringing out this arresting work in the face of others already established and in public favor.

EDMUND SEVERN:

In part four, Mr. Happich has filled a "long felt want." Advanced pupils who look foward to positions in Symphony Orchestras will here find a key to the understanding of the recent harmonic innovations of some modern composers. I shall take pleasure in recommending the work wherever I think it useful.

CARL TOLLEFSEN:

I have looked over your work, and in spite of the fact that I was skeptical that a new work on scales would really have anything new to say must tell you that I am more than enthusiastic over the way the subject has been handled. It is just this little touch of romance and history that will add zest to the student's work and give to this frequently neglected branch of musical foundations the impetus it needs. I shall take great pleasure in adding it to my teaching material.

MAYO WADLER:

Congratulations upon your "Scale and Chord Studies for Violin." It is the only work, to my knowledge, which adjusts itself to the changed nature of modern composition.

MAX JACOBS:

I looked your new work over carefully and want to take this opportunitty to thank you for your new ideas which will be a great help to the rising generation of violinists.

JOSEPH VILIM:

"Scales and Chord Studies for Violin," by William F. Happich are amongst the most important ever published.

LEO ORNSTEIN:

I find your work on "Scale and Chord Studies" for the violin most interesting. It should prove of great use both to the student and teacher.

THE GREAT LAKES QUARTETTE:

HERMAN FELBER, JR.,
CARL FASSHAUER,
ROBT. DOLEJSI,
WALTER BRAUER.

We wish to express great satisfaction in looking through your "Scale and Chord Studies." Your work is very complete, and we find it especially interesting since you recognize the value of practicing the whole tone scale, which most instructors ignore. Your studies will undoubtedly be a success.